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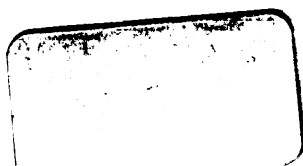
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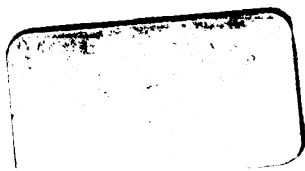
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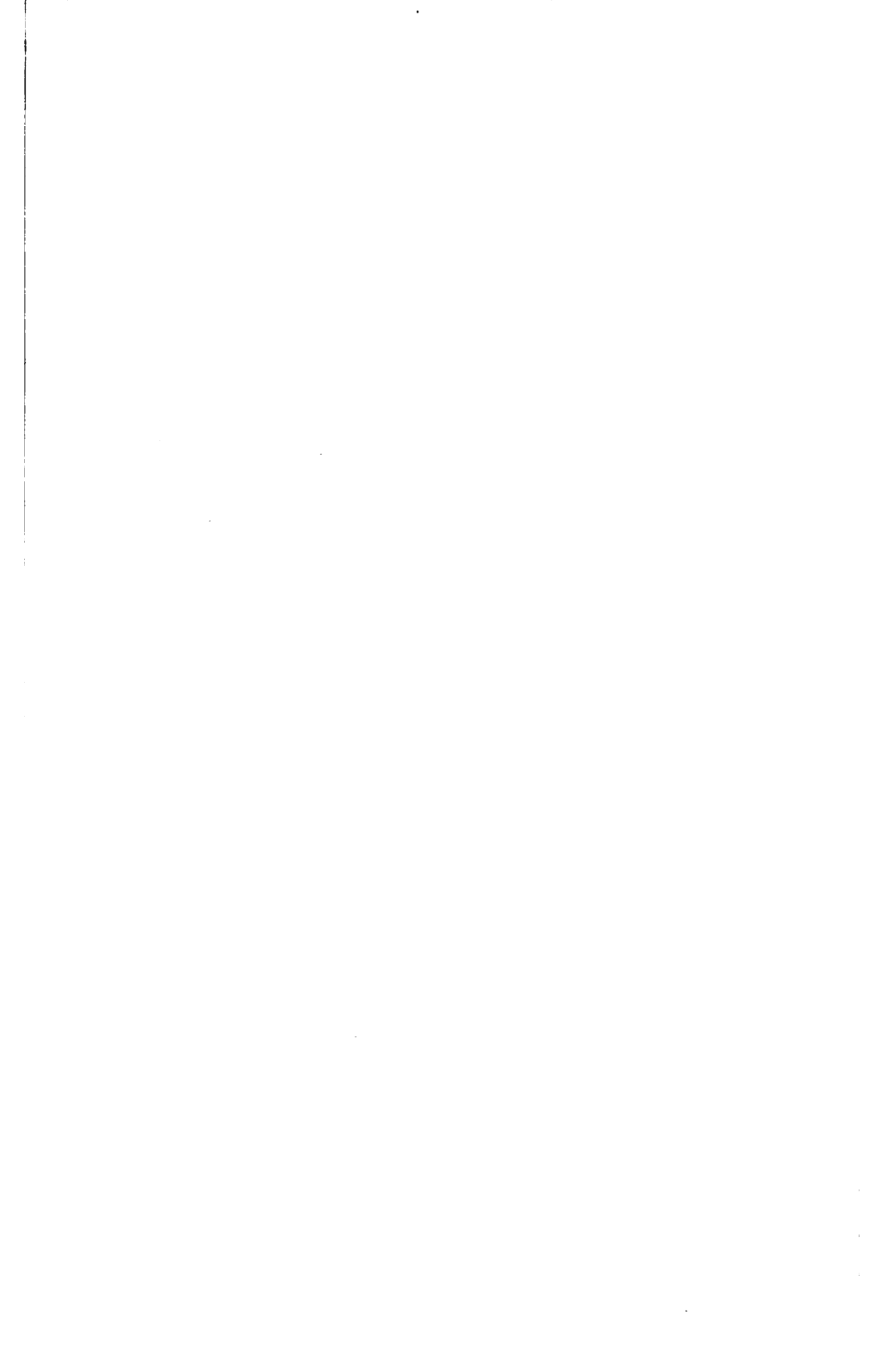


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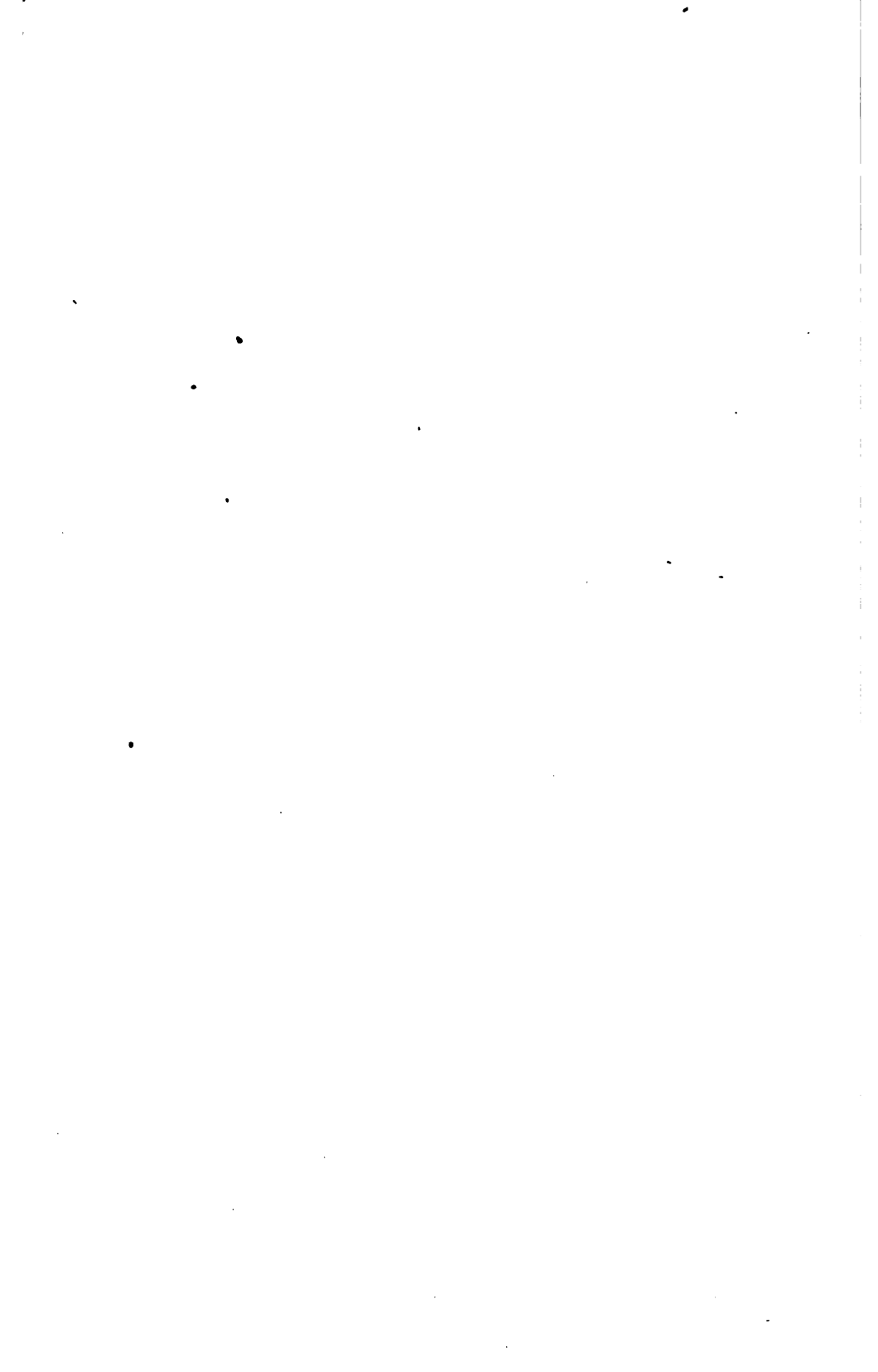
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SEVENTH ANNUAL REPORT

OF THE

STATE MINE INSPECTORS

OF THE

STATE OF MISSOURI,

FOR THE

YEAR ENDING JUNE 30, 1893.

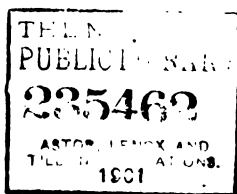


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LETTER OF TRANSMITTAL.

STATE OF MISSOURI
OFFICE OF STATE MINE INSPECTOR. }

To the Hon. HENRY BLACKMORE,

Labor Commissioner, Jefferson City Mo.:

Sir—I have, as Inspector of coal mines of Missouri, the honor to present herewith the seventh annual report of this department.

The year ending June 30, 1893, has been a reasonably profitable one throughout, to both operator and miner, and in consequence the relations existing between them have in the main proven harmonious. But five strikes have taken place, four of which were unimportant and short-lived; the other and only exception was in no sense due to causes or influences existing in this State.

The tables and other matter embodied in this report will be found to cover the following information: a record of the counties producing coal, the tonnage from each, the price and amount received for same; the number of men employed winter and summer, and prices paid for mining; the number of accidents in mines, with statement of causes leading to each fatal accident; the method of operating the respective mines, and the general condition of each as found at dates of inspection; the improvements made and contemplated, together with such additions, corrections, changes and improvements ordered by me to be made, as appeared to be demanded by the situation.

The volume of business for the past year, though largely in excess of any previous record, was accomplished with fifty-one less mines than for the year preceding, indicating a tendency to a consolidation of interests. That eventually the great bulk of the coal mined will be done or controlled by (comparatively) a very few of the large corporations should not be a surprising conclusion. When the advantages possessed by the larger concerns, consisting of large areas of the choicest coal lands, abundant means, the most perfect transporta-

facilities and the very decided advantages derived from the same, together with all of the other appliances of the most approved kind for the economical conduct of the business, are duly considered, we cannot avoid the above conclusion.

In the preparation of the statistical tables and maps found in this report, I have been fortunate in securing the services of Mr. J. W. Marsteller, whose reputation for thoroughness and accuracy I find so well merited.

I desire to thank you for the uniform kindness and consideration which you have at all times shown me; also your office assistants for their many kind services.

Respectfully,

CHARLES EVANS,

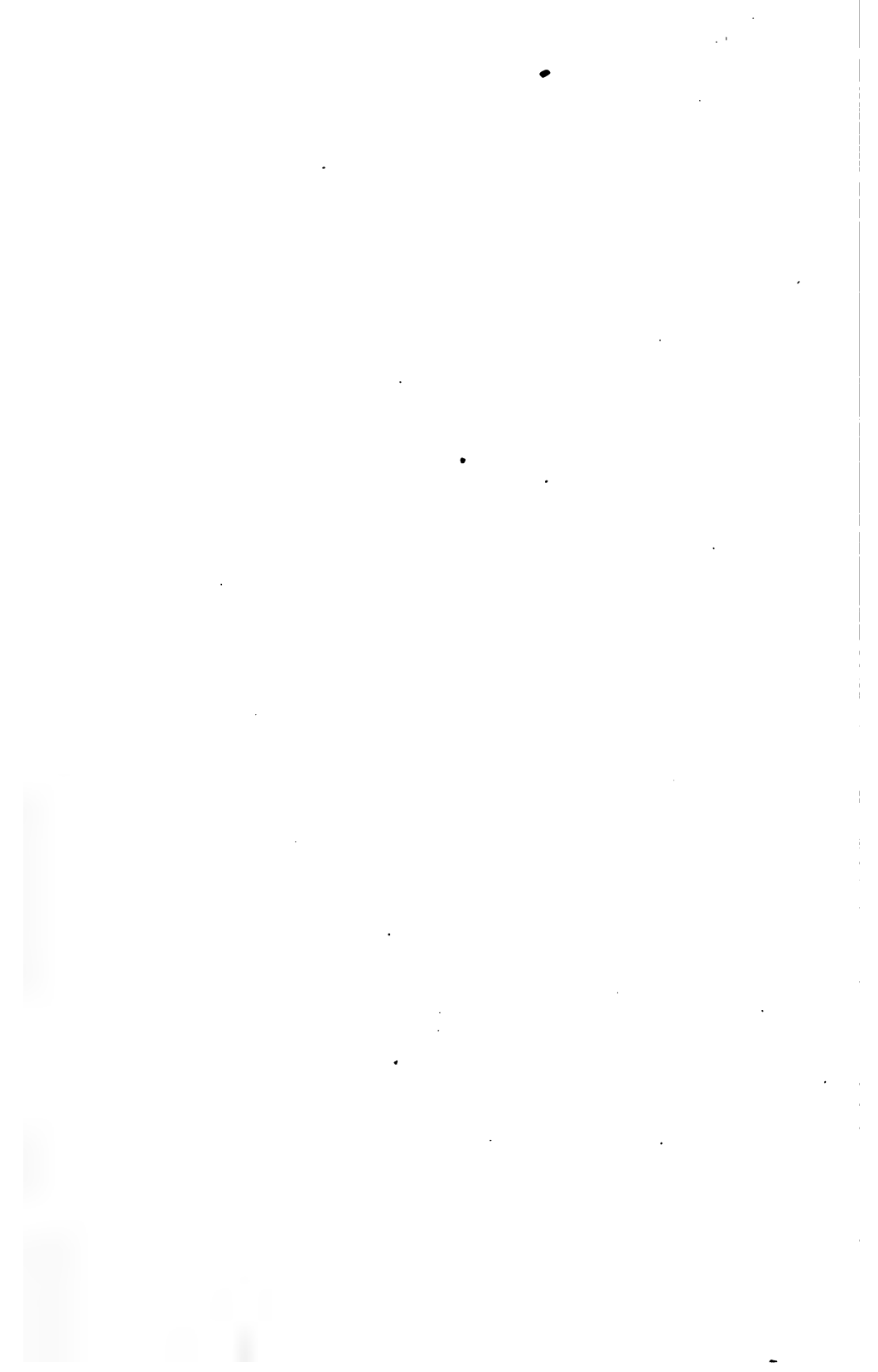
State Mine Inspector.

I was appointed State Mine Inspector by His Excellency, Governor W. J. Stone, on the 27th day of January, 1893, and assumed my official duties February 1st as successor to Mr. C. C. Woodson. From the date of my appointment to the close of the fiscal year of this Department (June 30, 1893), I had made 215 inspections, with reference to the ventilation of mines and the safety of the miner. The two essentials of safety in mining and the foremost object sought by my inspection was good ventilation and the safety of the miner, secured by the possession of facilities for exit in case of danger. To secure these and insure their observance, was what I considered the duty I had to perform. Two inspections were made of all the larger mines, and some of them were visited three times, as the requirements and the condition of the mine suggested on my first visit. Wherever a deficiency was found or the requirements of the law neglected, the superintendent or the operator was notified of the deficiency and instructed to have the same attended to as soon as possible. In a reasonable length of time I would revisit the mine to see that my instructions were carried out in compliance with the mining law.

The larger mines generally were found in a healthy condition, with the requirements of the law closely observed and obeyed, and whenever a deficiency was found, I had no trouble in having it remedied without apparent delay or annoyance. I have been as lenient as my position would permit in these matters, aiming to do justice to all, and, if possible, without injuring any one, and always with a due regard to my official duty.

Results of my labor on these inspections will be fully set forth on mines in this report.

As a result of my work in the field and instructions to mine-owners, I have to report the sinking of 13 escapement shafts (though some of them are not yet completed), the erection of five ventilating fans and four new furnaces and the enlarging of three old ones; three hoisting ropes condemned and same replaced by new ones; safety-catches have been attached to all cages; air-ways have been widened out and cleaned and new overcasts have been built. I have also urged the importance of adopting the double-entry system, and of splitting the air into separate currents in the mines. These features of practical mining offer a better system of ventilation, which can be extended from time to time with the best results until the mines be abandoned.



REPORT.

The seventh report of this department, not unlike its predecessors, shows that the coal industry of the State has made its accustomed annual increase in production. While the increase in tonnage for the year ending June 30, 1893, does not meet the expectations which the first six months of the year gave promise, yet, when the general business depression of the country is considered, it becomes unnecessary to seek for further reason. In view of this, the outcome proves encouraging and very satisfactory. By reference to the accompanying table it will be found that the coal product for the year equaled 3,190,442 tons, against 3,017,285 tons for the year previous. The actual amount received for the product at the mines aggregated \$3,999,681.17. This increased production was made with 51 mines less than operated the year preceding, showing not only a larger business for the mines operating, but the capacity and facilities for increased production as well. During the past year 404 mines, large and small, have been operated, and which are classed as follows: Shafts 154, slopes 85, drifts 92, and strip-pits 73. The power employed at 80 mines was steam, and at 119 horse-power was used. Artificial ventilation is produced by the use of 54 fans and 100 furnaces. The method of mining at 117 mines is under the long-wall system, and 211 mines use the pillar-and-room plan. The powder consumed in the mines the past year amounted to 64,553 kegs, costing \$132,131.90.

The average number of men employed in the mines during the winter months was 7285 miners and 1947 other employes; during the summer months 4859 miners and 1442 other help were employed, giving a total of 9232 men employed in and about the mines in winter and 6301 in summer, or an average the year round of 7766 employes. The total number of accidents for the year was 47, of which 21 were fatal and 26 non-fatal, causing 13 wives to be made widows and 43 children to become fatherless. The average number of tons of coal mined for each life lost was 151,926, and for each non-fatal accident 122,709 tons.

The following comparison made from the last coal report we have of the State of Iowa shows as follows :

That 369 men were employed in Missouri for each life lost.

That 134 men were employed in Iowa for each life lost.

That 298 men were employed in Missouri for each non-fatal accident.

That 92 men were employed in Iowa for each non-fatal accident.

This makes a creditable showing for our State, but we are satisfied that with due precaution on the part of our operators and miners, the average of fatal accidents would be still further reduced. We are fearful, however, the current year will not reduce the average, as there have been introduced in our State during the past few months so many foreign miners who are unacquainted with our methods, the nature and character of the coal and its mining, that many accidents are anticipated as a result.

TABLE I.

Recapitulation of general results of coal-mining operations in Missouri for the year ending June 30, 1893, compared with the year ending June 30, 1892.

	1892.	1893.	Increase and decrease compared with '92	
			Inc.	Dec.
No. counties in the State reporting on coal produced.....	33	34	1	.....
No. mines in the State including strip-pits.....	454	403	.....	51
No. mines employing 10 or more men.....	165	135	.....	30
No. fans in use.....	49	54	5	.....
No. tons produced.....	3,017,285	3,190,442	173,157	.....
Amount received for total output.....	\$3,825,828	\$3,999,681	\$173,853	.....
Average amount received per ton at mines.....	1.268	1.253	.....	1½c
Total number men employed in winter....	9,699	9,232	.....	467
Total number men employed in summer..	6,419	6,301	.....	218
Total number miners employed in winter..	8,563	7,285	.....	1,278
Total number miners employed in summer..	4,934	4,859	.....	75
Total No. other men employed in winter..	2,036	1,947	.....	89
Total number other employes in summer..	1,495	1,442	.....	56
Total number kegs powder used.....	53,450	64,553	11,103	.....
Total cost of powder.....	\$116,146	\$132,131	\$15,985	.....
Total number men killed in mines.....	20	21	1	.....
Total number of wives made widows....	13	13	.....	.....
Total number of children made fatherless.	46	43	.....	3
Total number of non-fatal accidents.....	41	26	.....	15
No. tons mined for each life lost.....	150.864	151.926	1.062	.....
No. tons mined for each non-fatal accident	73.592	122.709	49.119	.....
No. of new mines opened.....	23	17	.....	6
No. of mines worked out or abandoned...	10	7	.....	3

NEW MINES OPENED AND OLD MINES ABANDONED.

During the year seventeen new mines have been opened and seven old mines abandoned; in some instances it may be observed that several of the coal companies have worked out one mine to open another not far distant. With but two exceptions all of the new mines opened are upon an extensive scale, and supplied with the most modern and complete plants; in fact, no single year's experience in the coal industry of the State will compare with this year in the capacity and facilities of its new mines opened. The promise for a largely increased production for the current year is very good, and same confidently expected, provided that it be not too seriously affected by the present generally depressed condition of business.

From Table II it may be seen that Vernon county leads with six new mines opened and no abandoned mines. Lafayette county is credited with three new mines, Audrain county with two new mines, Putnam and Ralls with one new mine each, while Bates county has one new mine and four abandoned mines; Adair, Macon and Randolph counties each have one new mine opened and one old mine abandoned. The above record does not, perhaps, represent all the new mines opened nor all the old mines abandoned, as there are many small mines operating for a month or so at a time during the year, for the supply of the home trade, located in out-of-the-way places and seldom reporting to this office. However, all mines doing business worthy of note have been reported.

TABLE II.

Showing new mines opened, and old mines worked out or abandoned, during the year ending June 30, 1893.

County.	New mines opened.	Old mines worked out or abandoned.
Adair	By Pennsylvania Coal Co.....	By Pennsylvania Coal Co
Audrain	Martinsburg Coal Co.....	.....
Audrain	C. Turpin.....	.....
Bates	Rich Hill Coal & M. Co., M. No. 18.....	By Rich Hill Coal & M. Co., M. No. 3
Bates .....	.....	T. M. Martin (drift mine).....
Bates .....	.....	Wise Bros.....
Bates .....	.....	Rich Hill Coal & M. Co., M. No. 14
Lafayette.....	By Corder Coal & Coke Co....	.....
Lafayette.....	M. Hollowell .....	.....
Lafayette....	Mathews Coal Co.....	.....
Macon.....	Kansas & Texas Coal Co	By Kansas & Texas Coal Co , M. No. 27.....
Putnam.....	Mendota Coal Co .....	.....
Ralls.....	Vandalia Coal Co .....	.....
Randolph.....	Caffery & Baker Coal Co....	By Renick Coal Co.....
Vernon.....	Author Coal Co.....	.....
Vernon	Bedford Coal Co.....	.....
Vernon.....	Central Coal & Coke Co., M. No. 8 .....	.....
Vernon	Rich Hill Coal & M. Co., M. No. 16.....	.....
Vernon	Rich Hill Coal & M. Co., M. No. 17 .....	.....
Vernon	Vernon Coal Co.....	.....

IMPROVEMENTS.

The following table will furnish a list of the mines at which improvements have been made during the year just closed, and embraces the character of improvement made at both old and new mines.

Following is a summary of the various improvements:

New shafts... ..	2	New gates hung.....	2
New air-shafts.....	8	Brakes on drum	1
Escapement-shafts	15	Box-car loaders	2
Furnaces	9	Overcasts.....	2
Fans, new and those removed from old to new mines	12	Smoke-stacks erected and built higher	2
Engines erected	15	Boiler wall repaired.....	1
Boilers.....	7	New pit-cars added to equipment ..	340
Horse-power	1	No. miles new railroad track and switches.....	5
New electric plant	1	Shaft retimbered.....	1
Mining machines introduced during the year	6	Shaft bottoms retimbered	2
Automatic incline plane	1	Brick building for machinery.....	1
Revolving screens.....	2	Boiler-houses erected	2
Self-dumping cages.. ..	2	Engine-houses erected.....	11
New cages erected.....	7	Dwelling-houses for miners built...	31
New catch put on	1	School-houses for use of miners' children	2
Guide	1	Tip-houses erected.....	5
Wire ropes	4	Pit-heads erected.....	6
Holisting ropes	4	Tower built	1
New cables for underground work..	2	Landing platform	1
Track scales	2		

From the number of fans and furnaces added during the past year, it is apparent that ventilation is receiving much more attention from mine managers than formerly. It is a good sign, and will be regarded with approval by the many so deeply interested, and all those familiar with the necessity for pure fresh air in mines. The large number of escapement-shafts completed and in progress evidences the effort in the enforcement of the law relating thereto, as well as showing the willing observance by many of the same law. The sinking of escapement shafts to afford additional exit from the mines in case of accident, and increased artificial ventilation, so largely aiding in the prevention

of explosions, cannot be too highly commended. An operator cannot more wisely exercise his judgment than by bringing into practice those things which conduce to the health and safety of the miner; for in so doing, and aside from the charitable features, he is simply protecting his own interests by lessening the chances for accident and damages resulting. It is also a pleasure to note among other improvements, that of school-houses, built by operators for the express purpose and use of miners' children.

TABLE III.

Showing by counties the principal improvements made in and about Coal Mines during the year ending June 30, 1893.

County.	Name of company.	Improvements.
Adair.....	Pennsylvania Coal Co.....	Air-shaft sunk and furnace erected.
Adrain.....	Martinsburg Coal Co.....	New hoisting engine erected, new engine-house and tower built, and new cages, pit-cars and escapement-shaft in process of construction.
Adrain.....	Sherman, Bethel & Smith.....	Hoisting engine substituted in place of horse-power, and new engine-house, pit-head, cages, guides, wire rope and 15 pit-cars built.
Adrain.....	Vandalia Coal Co.....	Escapement-shaft completed.
Bates.....	Martin, See & Ferguson.....	Air-shaft sunk and furnace erected.
Bates.....	Rich Hill Coal and Mining Co.....	Fan erected at mine No. —, to take place of furnace. Fan substituted for furnace at Slim Jay mine. A 15-foot fan substituted for the 10-foot fan at mine No. 16, and over-cast built at latter. Air-shaft sunk at mine No. 13. At mine No. 18 one-half mile of railroad track has been constructed, a new engine-house and 10-foot fan erected, and an escapement-shaft sunk.
Bates.....	J. M. Wise mine.....	Fan erected to take the place of a furnace.
Caldwell.....	Caldwell Coal Co.....	Escapement-shaft sunk and fan removed to same. New hoisting rope and track scales put in.
Caldwell.....	Kingston Coal Co.....	Gates hung at shaft opening. An escapement-shaft sunk and shaft bottom timbered.
Clay.....	North Kansas City Coal and Mining Co.	Escapement-shaft in course of construction.
Grundy.....	Grundy County Coal Co.....	Escapement made by an underground connection between mines Nos. 1 and 2.
Henry.....	Co-operative Coal Co.....	Escapement-shaft completed and brake placed on drum.
Henry.....	John Thompson & Co.....	Fan erected to take the place of furnace.
Lafayette.....	Lafayette Coal Co.....	Escapement-shaft completed and furnace built.
Lafayette.....	Bonanza Coal Co.....	Furnace built and height of smoke-stack increased.
Lafayette.....	Lexington Coal and Mining Co.....	A substantial brick building for the accommodation of a \$20,000 electric plant, consisting in part of two boilers, one H. P. Ideal engine of 150-horse power, and one Sperry 160-horse power dynamo, and six Sperry long-wall mining machines.
Lafayette.....	H. Macy Coal Co.....	Furnace enlarged and smoke-stack built higher.

Lafayette.....	Mathews & Co.	New engine-house and pit-head erected; new engine, cages, ropes and pit-cars put in, with an escapement-shaft in course of construction. A side-track has been constructed, connecting the mine with the C. & A. R. R.
Lafayette....	Y. S. A. Coal Co.....	An air-shaft completed, new furnace erected, shaft retimbered and new holisting ropes put on.
Macon.....	Kansas & Texas Coal Co	New cable rope for underground haulage at mine No. 33 has been put in, and at same mine new boiler-house has been erected and boilers removed to same. At mine No. 43 a new cable 1200 feet, with engine to work same, two new boilers, a box-car loader and 60 new pit-cars have been added to the equipment of the mine; also two new dwelling-houses and a school-house for the use of miners' children have been erected. At mine No. 46, box-car loader, self-dumping cage, a cylinder boiler and 60 new pit-cars have been added, together with the erection of three new dwelling-houses and a school-house for the use of miners' children. At mine No. 48 a new engine-house and pit-head have been erected, and there has been added to the plant a new engine, a 12-foot fan, new cages, ropes and pit-cars. An escapement has been sunk, and a half mile of railroad track constructed.
Macon.....	W. Watson & Co	Completed an air-shaft.
Putnam.....	Blackbird Coal Co.....	An engine-house and tip-house erected, a new engine and holisting rope added, and fan put in to take place of furnace.
Putnam.....	Mendota Coal Co.	Air-shaft completed at mine No. 1; an additional 30 feet built to landing platform, and 30 new pit-cars purchased. Mine No. 2, escapement-shaft completed, furnace erected, hoisting engine put in, and 20 dwelling-houses built for miners. Mine No. 4, air-shaft sunk.
Ralls	Vandalia Coal Co	Six dwelling-houses and furnace erected.
Randolph....	Caffery & Baker Coal Co.....	Air-shaft sunk, hoisting engine, furnace and revolving screens erected; one mile of railroad track constructed.
Randolph....	Fleming Coal Co.....	New engine-house and hoisting engine erected.
Randolph....	Higbee Coal Co.....	New engine and boiler-house erected; boiler walls remodeled and shaft bottom retimbered.
Ray	Kansas & Texas Coal Co.....	Tip-house rebuilt, new cages and new catches put in. The pit-top is being rebuilt and strengthened.
Vernon.....	Rich Hill Coal and Mining Co	At mine No. 16 an escapement-shaft has been sunk, a 10-foot fan and engine put in, and one mile of track laid. At mine No. 17, new tip-house, pit-head and engine-house built and engine put in; one mile of railroad constructed.

IMPROVEMENTS IN COAL MINES—Continued.

County.	Name of company.	Improvements.
Vernon	Central Coal and Coke Co.	At mine No. 8, a new plant, an escapement-shaft has been sunk, a 10-foot fan put in, and a self-acting incline plane constructed. New tip-house, pit-head, engine-house and engine. be mentioned new cages, ropes and pit-cars. New engine-house, engine and 10-foot fan erected, and escapement-shaft sunk.
Vernon	Bedford Coal Co.	
Vernon	Vernon County Coal Co.	

VENTILATION.

No single feature connected with the management of coal mines demands more attention of a superintendent or mine foreman, in the matter of good judgment and experience, than that of ventilation. The Coal Mine Inspector, regarding it with reference to its vital importance in connection with the health, comfort and safety of the miner, gives it his first and best attention, and finds it one of the most difficult matters to control that he meets with in the exercise of his official duties.

The first difficulty met with, and the one most common, is traceable directly to incompetency of the party in charge of the mine, and the second is an indifference to all other considerations than that of the economical management of a mine, carried to a point bordering on criminality. A further trouble is experienced by reason of the crude and temporary methods employed oftentimes in the opening up of a mine, in which no thought, it would appear, had been given to future necessities, nor to the demands made by nature, for an increase of pure and fresh air, for each additional foot of progress made in the interior of the coal field.

It is not an unusual experience to find extensive mines under the management of men who are lacking in the knowledge of the very first principles of the law regulating and governing ventilation, where not only large property interests are involved, but where also are at stake the welfare, the health and lives of several hundred human beings. When mines have been opened out in the way described and the errors commenced with and continued year after year, it is not only difficult, but an expensive undertaking, to place them in a healthy and satisfactory working condition. Mines worked after the manner described require double the attention from an inspector that others do that have been opened out with something like system; and should the Inspector be found displaying some zeal in his efforts to have mines when newly opened conform to modern methods, it should be remembered that he is simply trying to avoid future trouble for operator as well as inspector. Experience, especially in coal mines, teaches us that the best way is not only the safest, but in the end the most economical.

Under the existing laws relative to ventilation, the Inspector feels dwarfed in his powers and opportunities, to bring about that change and improvement in mine ventilation which he regards of paramount importance. The present law requires that "100 cubic feet of air per man, per minute, measured at the foot of the down-cast, shall be forced through the mine and to every working place." The foot of the down-

cast is simply the mouth wherein the air enters the mine proper. Here the air is of necessity pure and fresh. Measurement of the same is required to be made at this point, where the largest volume possible to enter the mine, is confined to a narrow space, in the limits of which no opportunity has been afforded for its waste or contamination. After the air-current passes the place where the measurement of it is required to be made, and enters on its errand of mercy to distant parts of the mine, it has first to traverse sections where rooms have been worked out and same made gas magazines by the storage of waste; gob-fires originate from this, and hence congestion of this entire section, by the foul gases thus generated results. True, it may be claimed that entrance and openings to these worked-out places may be stopped up, yet how difficult is it to prevent leaks, especially in a coal mine. This air-current in its travels has not only absorbed the gases on its way through the abandoned portion of the mine, but by reason of neglected and poorly constructed stoppings, broken doors and numerous opportunities for leaks, has gradually grown less in volume. For reasons given, the air has by the time it reaches the miner been rendered not only short in quantity but robbed of its life-giving properties.

The best authorities on the subject insist that under the most favorable conditions at least 100 cubic feet of air per man, per minute, should pass, in order to maintain good sanitary conditions in a mine. This being so, it is apparent that the law does not provide for a sufficient amount of air in mines where the conditions are unfavorable, for there are many mines in operation as described above, and which, in addition, contain gas, fire-damp and other impurities.

For the above reasons, and from our own experience, we are fully convinced that the legal requirement of "100 cubic feet of air per man, per minute, measured at the foot of the down-cast," should be increased at least 50 per cent, in order that the Inspector of Mines may have greater latitude in determining the amount of air that may be necessary, conditioned upon the necessities of the respective mines.

After having made a personal examination of all the important mines in the State, it is with much satisfaction that we are enabled to report most all of the large mines well ventilated, with a volume of air found circulating fully up to the amount required by law. However, in several instances, we found while the volume of air was in excess of the legal requirements along main entries, yet there was a deficiency at the face of the working places. This last trouble, we think, is due almost entirely to neglect in properly conducting the air-current into the rooms. We have made every effort to bring about the general adoption of such methods as would utilize to the fullest

possible extent the volume of air forced into the mine at the expense of so much power and money, and thus avoid not only its waste, but prevent the evil effects on the miner from the bad and limited amount of air resulting from this loss.

There are other mines still, where the volume of air passing on main entries was measured and found in double the quantity lawfully required, yet at points where it was needed, was found so impregnated with noxious gases as to be unfit for respiration. In the Lexington, Richmond and other long-wall districts we could mention, a better and more healthy condition of affairs may be experienced with 75 cubic feet of air per man per minute, passing, than would result with 150 cubic feet per man per minute in the mines of Bates, Macon and Randolph counties. The reason to be assigned for this wide difference in the respective districts mentioned, may be found in the custom prevailing in the last named counties of depositing all the refuse material in the worked-out rooms, from which it is only a question of time when slow combustion sets in and poisonous gases are thrown off.

Still another fruitful source of trouble existing in the same counties, is traceable directly to the large amount of powder used in mining the coal. There is nothing in our laws by which we are authorized to require operators to split the air into separate and distinct currents, in order that the air-current may be more equally distributed to the miners located in different parts of the mine. The mine boss may send an unbroken current of air around the entire mine, and the volume of which may measure the required amount, yet the last miners reached by it may have a vitiated air to breath. This result, especially in large mines, should be easily comprehended. One has only to consider the number of men and mules, reaching often into the hundreds, employed in a mine, confined to an artificial atmosphere exclusively, each one of which is living in and breathing the same air; that each man and mule is continually throwing off an impurity duly absorbed by the air, in the respective working place, which air is then forced already loaded with such impurity, to gather still more of the same as it comes in contact with other men and mules. Then to have added to the above, as must be, that nightmare associated with the ventilation of all coal mines, viz.: the natural impurities or gases of a coal mine, should lend emphasis, we think, to the importance of the subject, and point to the reasonableness for our anxiety in the matter.

For these reasons we esteem it highly important that the Mine Inspector be granted larger and more of discretionary power to the end that the miners shall be furnished with as much and as pure air as

the situation will admit of, by enforcing a judicious application of the most approved methods and appliances.

Gross carelessness in the matter of ventilation is often encountered, and repeated efforts made for correction by the use of argument and persuasion, and in many instances without avail. Anticipating the question which would naturally arise from such an assertion—i. e., why I did not enforce such corrections—my answer is simple and easy. The lawful conditions under the present law were found to exist at the foot of the down-cast, and here authority ended, although in the same mine and at the same time the miner at the face of the workings might be receiving one-half the air he required, and that vitiated.

Unfortunately the laws of this State make no provision for the competency of a man acting as manager or foreman of a mine. That day when such omission could under any possible excuse be permitted is in the past. The mines of the present day are so extensive by comparison with former years that six of the large mines now being operated produce more coal than twelve years ago was produced by every mine in the State.

Coal mining, under the most careful and competent management, is regarded as extra-hazardous, but how serious becomes the risk when the control and operation of a mine is entrusted to men who could not pass an examination which would indicate their fitness by reason of a practical knowledge of the under-ground work, nature and effects of gases to be found, and the laws governing ventilation. As a sample qualification of some few, the following instances are cited :

At a mine in Lafayette county, finding the miners out, inquiry was made of the mine-boss as to his trouble in ventilation. He replied that the wind was in the wrong direction, but as soon as it got around in the other direction he would get good air in the mine.

In Bates county we visited a mine where 15 men were at work ; upon an examination found that our lamps would barely burn, and could not detect the slightest evidence of a current of air. In fact, the air was at a stand-still. Calling the attention of the mine-boss to the situation, his only excuse was that the weather was too warm, claiming that if it got cooler good air would be found traveling.

In Macon county a mine-boss volunteered the information that his mine was exceedingly well ventilated. Upon making an examination found 23,000 cubic feet of air per minute passing, but at the working face in no instance did we find a sufficient amount of air. Now this man, with 150 men working under him, imagined he had a well-ventilated mine, because a good current of air was passing in main entries

and air-courses, while in fact nearly every miner in every part of the mine was suffering for lack of good air.

At another mine, in the same county, we gave instructions to the mine-boss to make certain changes to better the ventilation. Upon visiting the mine again, and noticing my instructions had not been complied with, was informed by the mine-boss that his superintendent would permit no improvement unless the mine earned it, though at the time the mine was working only half time.

It is a grievous mistake for a company to place a man in charge of work with which he is totally unfamiliar. He is of necessity an unnecessary evil about a mine, and his efforts cannot prove other than a failure. We have desired to avoid personalities, but, if the accusations contained herein should meet the eye of any one who may feel the thrust, and decide him to improve and try to befit himself for a position involving the safety and health of so many of our fellows, then our object will have been attained and our aims accomplished.

OILS USED IN MINES FOR ILLUMINATING PURPOSES.

Of the 404 mines operated in this State during the past year, 32 out of the above number produced two-thirds of the entire coal output. This plainly shows the capacity as well as the extensive underground workings necessary to bring about such results. Up to within the past few years our mines were small in comparison with those now operated, and did not require the many additional safeguards since demanded by their more extensive operations. Hence it is that but little if any attention has been directed to the evil effects produced by the use of impure and adulterated oils used by miners for illuminating purposes.

Now that we have mines which are from 40 to 450 feet deep down in the bosom of the earth, where miles of underground roadways have been cut out, and from which are branching off from 200 to 400 rooms, completely honey-combing square miles of territory, working in which may be found several hundred miners (with death lurking in the darkness behind them and hiding in the rock before), cut off from the world above, except for two small openings, and from which the miner may be distant a half mile or more in his working place—for these reasons we think every possible precaution should be taken for the protection of our fellows. When the ordinary and expected troubles arising in extensively opened up mines require so much attention and expense to keep them in a safe and healthy condition, it is surprising that mine operators will permit the introduction of foreign or artificial impurities, and this is undoubtedly the case when miners are allowed to burn adulterated oils in a mine.

Experience in many mines has fully demonstrated the fact that the volume of smoke thrown off by the use of impure oil in the miners' lamps was sufficient to cause the air of a mine to become so dense and stiff as to make it difficult to detect the elements of danger existing in the same. The amount of smoke arising from a single miner's lamp may of itself appear small; but let this be multiplied 200 times in a place like a coal mine; and the result would prove astounding. Such smoke is not only unfit for respiration, but it has been known to intercept and retard the lawful volume and flow of the air of a mine. The indifference displayed with reference to the character of oil used in our mines has resulted in the boldest and most bare-faced adulterations. If manufacturers and those who sell this oil to miners could or would contemplate the possibilities and consequences likely to result from its use in the matter of accidents and injury to health, they would hesitate becoming accessory, as they certainly are, in the propagation of a positive evil. Mine operators may provide the most expensive machinery and furnish every known facility for the proper ventilation of mines, and yet, so long as they permit the indiscriminate use of such vicious oils, just so long will they have a vitiated air in their mines. Miners understand its evil effects, and to a man will condemn it; yet the temptation to economize, with many, becomes so great under the impression that a single lamp burning such oil will produce no appreciable results, that they make use of it; but unfortunately there may be many more who think the same way; then when the evil results are noticed, no individual miner feels disposed to stop its use, because other miners use it.

The operator and the miner alike are in duty bound to make such effort as will properly present the matter to the Legislature, with a view to the passage of such law as will require a standard of purity for all oils used in mines for illuminating purpose. Such effort will meet with my hearty co-operation, as I not only recommend such law, but trust to such immediate action on the part of both employer and employe as will forever stamp out the use of any impure oil in the mines.

FANS.

Of all the mechanical appliances that have been used to ventilate mines, the fan is undoubtedly the best under any and all circumstances. Ventilation produced in a mine by a furnace varies through the day by the irregularity with which the fire is fed, while with the fan, when once started, it is practically constant. The efficiency of the fan to do effective work depends on its construction and general surroundings. Fans should be set on the top of an air-shaft and be constructed so as

to take air on both sides, and be fitted with doors, so as to be reversible, in order to force or exhaust, as the requirements of the mine may be, and driven by a horizontal engine connected direct to the fan-shaft, without the use or aid of the belt.

There are 54 fans in use at the different mines in this State, some giving good results, while others are so poorly constructed that not 25 per cent of the power expended is received in useful work. The practice of setting the fan on top of the hoisting-shaft, to force or exhaust through a space partitioned off from the same, should be abandoned, as the efficiency of the fan is greatly lessened by the small area the air has to travel in; and considerable of the air is lost by returning to the fan, through leakage in the partition, without reaching the workings.

We have noticed one great evil among mine-bosses, which is a general one, especially where a furnace is used for ventilation; we refer to tardiness in building the fire in the morning. During the night, while the fire is banked, circulation stops, and an accumulation of foul gases is constantly forming.

The furnace should be started early enough to have all such accumulations swept away and a steady stream of fresh air flowing through the mine before the miners enter. Where fans are used, our attention has often been called to the practice of stopping them through the night, and where the mines are extensively worked an enormous quantity of black damp accumulates, which the miners must inhale every morning, owing to the carelessness and neglect.

The sanitary condition of all mines depends greatly on the competency and faithfulness of the mine-boss or manager, and the greatest obstacle the Mine Inspector has to contend with in order to have the mines properly ventilated, is that found either from the neglect or incompetency of those in charge; and in view of these facts I am of the same opinion as my predecessor, Mr. Woodson, that a law should be passed to require mine-bosses and mine managers to pass a rigid and a practical examination, and be required to procure a certificate of competency before they be permitted to have the care and the safety of their fellow-men under their charge. At one mine in this State we found 80 miners, 15 mules and 15 mule-drivers working in the one current of air, with an average of 200 pounds of powder exploded at noon every day; the air had to travel through old entries for thousands of feet, where numerous stoppings were leaking and a slow combustion had been in action for some time, thus making it a positive poison to any one inhaling it. Now, there is no one in a mine that

should be better able to judge of the requirements of a mine than the mine foreman or superintendent, if they be worthy of the position they hold, as in most of the mines they have entire control of the ventilation.

There are many valuable books written on mines and mining by good authors, which should be read and studied by all mine-bosses and miners, as valuable information can be obtained on all subjects, especially that of ventilation.

DOORS IN MINES.

In the mines, it is necessary oftentimes to prevent the passage of air in the same direction in which men and boys are required to travel. In such cases, doors have to be placed for its stoppage. It therefore becomes the important duty of a mine manager to see that all such doors are well constructed, properly hung, fit tight and fall with the air. The opening of a door, even to permit the passage of a man or mule, has a bad effect on the air current, as a portion is thus allowed to pass in a direction where it is not needed. To avoid much of this waste, two doors should be hung and placed far enough apart so that one of them may be at all times closed before the other is opened. When a mine is running full time, the doors on main roadways are open nearly half the time, and during the passage of long trips the ventilation is greatly disarranged. At some of our mines drivers are expected to open and close doors, where trappers should be employed for that purpose. During visits of inspection we have often found doors on main entries wide open, thus cutting off all ventilation from the men.

With the double-entry and long-wall systems of mining, the working place of miners can be well supplied with fresh air if the doors be properly hung and attended to and the air-courses kept open. Sufficient attention is not at all times given by those in charge, in keeping doors and stoppings in good trim and air-tight. A few thousand feet of air are easily and quickly lost to the ventilating current by the many small leakages of various kinds.

Canvas doors and curtains are found on roadways where wooden doors should be hung. Canvas, when first introduced, was used only in gaseous mines as a brattice, to carry the air from one cross-cut to another while driving entries. But now, much use is made of canvas for doors on the principal entries of some of our large mines, and it is not an unusual thing to find canvas doors located at important points, where they are allowed to remain unrepaired after having been split and torn by passing cars until they are reduced to little less than

strings. The use of doors on principal entries is objectionable, and should be avoided when possible; they are much less in use than formerly. The neglect of closing a door often leads to serious results, and large air-shafts and powerful fans are of little benefit to miners unless the ventilating current is conducted around the mine by the use of well constructed doors.

STRIKES.

The Bureau of Labor, of which we are a part, gives special attention to strikes, and reports in detail upon all that occur in the State. For this reason, this report will but briefly refer to strikes occurring at coal mines. For the year ending June 30, 1893, but five strikes occurred, four of which were unimportant, lasting three days, two, three and four weeks, respectively—the remaining one, and the exception, being that at the Wear Coal Co. mine No. 1, at which the cause for the same will be found resulting from influences outside of and foreign to any occasion for a strike in this State. The following reference to strikes indicates the cause, duration, number of men engaged in the same, and the name of operator or mine where the strikes occurred.

AUDRAIN COUNTY.

Vandalia Coal Co.—A strike occurred at this mine, due to the demand of the miners for an increase in the pay for mining. The company refused to grant the advance, and after having been out two weeks the miners resumed work; about 40 miners, averaging \$2.35 per day, were affected by the same.

BARTON COUNTY.

Wear Coal Co.—The miners at mine No. 1, located one mile from the Kansas state line, ceased work and came out on a strike, May 20, 1893. To more fully make plain the causes leading to this strike, a brief resume of the mining situation in this district as it has existed for the last few years, is made necessary.

This mine (No. 1) at Minden is claimed by the miners as being located in a part of the district composed of Cherokee and Crawford counties, Kansas, the latter being only a mile or so distant, and across the State line. Since the operation of the mines in Crawford and Cherokee counties, Kansas, some 10 years ago, the miner has been paid from first to last, 4 cents per bushel for winter and 3½ cents in summer for screened lump coal, during all of which time no strikes of any importance have occurred. The miners made good wages and the operators a fair return upon their investment.

Last fall the reform Legislature of Kansas passed what is called an "Anti-screen law," somewhat similar to the screen law as it now stands upon the statute books of Missouri. The enacting clause of this law stated that it should go into effect September 1, 1893.

The operators (as they stated), recognizing the fact that to comply with the law a change of price would be necessary, as they could not afford to pay as much for mine-run coal as they had been paying for screened lump coal, and believing, further, that trouble might result in establishing a basis upon which to make a price, shortly after May 1st posted the following notice at all the mines in the district, viz.:

That on and after May 20th, the following prices would be paid for mine-run coal: 47 cents per ton of 2000 pounds for the six summer months, and 53 cents for the six winter months.

The above prices the operators claimed to be equal to prices formerly paid. The miners refused this offer and demanded for the six summer months 62½ cents per ton, and for the six winter months 75 cents per ton. This the operators would not pay, consequently the miners quit work. After several conferences for the purpose of adjusting matters, all negotiations were declared off.

This mine being located in Missouri and subject to Missouri laws, the price paid prior to and up to the strike was 57 cents in summer, and 70 cents in winter. As this mine was nearly worked out, and the operators desirous of taking out the remaining coal, they proposed paying the old price, which was refused. They then offered the miners \$2.25 per day, clear of all expense; this also was refused, miners claiming the mine was to all intents and purposes a part of the Cherokee and Crawford county district, and that they could not in justice to the miners across the line accept anything less than demanded by them. As a result, the operators abandoned the mine and moved the plant to another location.

Between 50 and 60 miners were employed here, and the loss to each is estimated, from the time the strike occurred to the end of our fiscal year, June 30, 1893, at \$75.

LAFAYETTE COUNTY.

Waverly Coal Co.—On account of a proposed reduction in the price paid for mining from 75 cents to 60 cents per ton, a strike occurred on the 1st day of March, 1893. The mine remained idle until April 1st, at which time the C. O. Godfrey Co. leased the mine and compromised with the miners by the payment of 62½ cents per ton.

MACON COUNTY.

Little Pittsburg Coal Co.—A strike occurred at this mine April 17, 1893. The miners claimed that the mine was dry and hot, and demanded that the roadways be watered, which was refused. About 75 miners were employed, a majority of whom voted for a strike unless the demand was acceded to. The strike lasted about six weeks, with an average loss to each of \$1.50 per day. Miners finally returned to work under former rules and prices.

Loomis Coal Co.—A strike at the mines of this company occurred about April 1, lasting only a few days. The trouble grew out of the demand by the miners for a check-weighman, which was at first refused. The request was granted and men again went to work.

REPORTS OF INSPECTION.

ADAIR COUNTY.

Production, 20,957 tons.

The greatest portion of Adair county is underlaid with the coal measure formation and has been mined in different parts of the county, but only in a small way. Seven mines were operated during the past year, which produced 20,957 tons of coal, an increase over the preceding year of 6,173 tons. The product was sold for \$31,247, or at an average of \$1.49 per ton at the mines. The principal mines are located at Danforth and Stahl, with local mines at other points.

A description of the mines is as follows :

KIRKSVILLE POSTOFFICE.

The mines in the vicinity of Kirksville are located on Hazel creek, and are operated by the following parties: John Besanko, drift opening; James and M. Inbody, drift opening; D. W. Scott, shaft, horse power; Jacob Seinetts, drift opening; Robert B. Shunk, drift opening. All the above mines are working the same seam of coal, which runs from 3 to 4 feet in thickness; worked on the pillar-and-room plan. Coal is consumed at Kirksville and surrounding county.

STAHL POSTOFFICE.

Several small mines are operated in the vicinity of Stahl during the winter to supply local demand. The following is the list of operators: A. Ford, drift opening; Harriott Bros., drift opening; Jacob Ledford, drift opening; Jacob Novinger, drift opening.

All mines at Stahl work same vein of coal, which averages 3 feet 8 inches in thickness. This is a different vein, however, from that operated at Hazel creek. Coal is consumed at Green City and Greencastle.

Pennsylvania Coal Co.—H. C. McCahan, president, and John Dawson, superintendent. This company is operating two mines in the county, one of which is located at Danforth and the other at Stahl, and each connected by the Q., O. & K. C. R. R. by switches. The mine at Danforth has a shaft 48 feet deep, equipped with steam power. Mine

is ventilated by a ten-foot fan, which was giving fair results at date of inspection, April 25. The coal will average about 3 feet 8 inches in thickness, and, in our opinion, is the same seam as that operated in Macon county. Mine is worked on the pillar-and-room plan, and the coal mined by blasting. The company pays for screened coal, in winter, \$1, and in summer 87½ cents per ton. The mine has been in operation quite a number of years, and is worked on an extensive scale. It is not in the best condition. The coal is nearly all consumed by the railroad company. About 50 men on an average are employed during the winter. The mine at Stahl is a drift, opened up this year. Ventilation is produced by a furnace which was giving good results. The coal is about 40 inches in thickness, worked on the pillar-and-room plan. The company pays for screened coal \$1 in winter and 80 cents per ton in summer. The coal is of fine quality, overlaid with an excellent roof, and is undoubtedly the same seam as that worked at Mendota and other portions of Putnam county. A large amount of the coal is shipped to Quincy. Mine in good condition, with about 30 men employed.

AUDRAIN COUNTY.

Production, 42,262 tons.

Audrain county is yet in its infancy in coal production. The county is nearly all underlaid by a 30-inch vein of coal. New mines have been opened during the past year, and old ones have been improved and enlarged.

The county shows an increase in her output over the preceding year of 12,470 tons of coal. During the past year 42,262 tons were mined, which was sold for \$62,085, or an average of \$1.47 per ton at the mines. It will be seen by the above that while the output has increased about 30 per cent, the average price has decreased 21 cents per ton.

The largest mines are located at Farber, Laddonia, Martinsburg and Vandalia, and another extensive mine is being opened at Mexico, where a pocket of coal has been discovered.

Nine mines were operated during the past year, descriptions of which are as follows:

FARBER POSTOFFICE.

Sherman, Bethel & Smith—Mine situated at Farber and connected with the C. & A. R. R. Shaft 100 feet deep, hoisting by steam-power. Formerly the product was hoisted by a horse; but during last winter the company erected a steam plant and built a new pit-head, put in

new cages, new guides and pit-cars, which increased the output of the mine to double its former capacity. Coal 26 inches thick; worked on the long-wall plan; mine ventilated by a furnace; was found dry and in good condition; about 20 men employed.

LADDONIA POSTOFFICE.

C. Turpin—Mine located at Laddonia; shaft 55 feet deep, and the hoisting done by horse. This is a new mine opened last winter, and has commanded a good local business, as it is so convenient for town trade. Coal 26 inches thick; worked on the long-wall plan, with 6 to 10 men employed. Several parties have been operating mines on Hickory and Cuiver creeks, hauling the coal to Laddonia to supply local trade; but since this new mine has started most of the old ones have closed.

Martinsburg Coal Co.—S. Foster, president, and A. R. Nelson, superintendent. Mine located at Martinsburg, connected with the Wabash R. R. This company is composed of 13 miners, who formed a co-operative company and sunk a shaft at this place. They struck coal at the depth of 107 feet. Steam plant was erected and a good pit-head built, and the mine well equipped. Coal 30 inches thick; worked on the long-wall method. The coal is overlaid with extra good roof, requiring very little timbering; mine dry and in good condition; employing from 25 to 35 men. Coal consumed at local points along the line of railroad.

MOUNT CARMEL POSTOFFICE.

Detinnee Bros. are operating a mine at this place to supply local trade.

They abandoned one shaft last winter owing to bad roof, and opened out another shaft, which is in operation at present.

VANDALIA POSTOFFICE.

Audrain Manufacturing and Mining Company—C. Dixon manager; mine located at Vandalia; shaft 65 feet deep; equipped with steam plant for hoisting; ventilation is furnished by a furnace, giving very fair results. Date of inspection, April 3. Coal 28 inches thick; worked on the long-wall system, with good black slate for roof. The coal is underlaid with good fire-clay, which is taken out at another part of the mine, leaving the coal for roof. The clay mine is worked on the room-and-pillar plan, and requires considerable timbering to be kept secured. All the coal produced is consumed at the mine in the manufacture of the clay into brick and other articles, giving steady employment to 75 men around the mine and the brick works.

Vandalia Coal Company—Mine located west of Vandalia and connected with the C. & A. R. R. Shaft 75 feet deep and equipped with good machinery. Mine is ventilated by a fan, which was giving good result, and causing plenty of fresh air to pass around the face of the workings. Coal 30 inches thick, worked on the long-wall plan, and mine employing about 50 men. This company is composed entirely of practical miners, who formed a co-operative company nine years ago, and started the first mine at Vandalia, without anything to back them up but stout hearts and willing hands. But through good management and industry they have prospered, and are today owning and operating four good mines in three different counties in this State.

Coal chutes have been erected at this mine, and the product is consumed by the railroad company in coaling their trains. Mine in good condition.

BARTON COUNTY.

Production, 61,301 tons.

The coal production of Barton county shows a large decrease during the past year as compared with the former year. The report for that year showed the output to have been 108,784 tons, while the report for this year gives the product at 61,301 tons, showing a decrease of 47,483 tons. This large decrease is probably due to the recent strike among the miners of Kansas, at which time the principal mines of this county were closed down for months. Twenty-two mines were operated during the year, but most of them are small, and only operated during the fall and winter to supply the local trade. The largest mines are located at Liberal and Minden, from which points the coal is taken to market over the Mo. P. and K. C., Ft. S. & M. R'y. Following is a description of the principal mines:

State Line Shaft—S. H. Lanyon & Bro, managers; John Langue, pit-boss. This is the mine formerly owned by C. H. Morgan, and is located 1 mile southwest of Minden, connected with K. C., Ft. S. & M. R. R. Shaft 45 feet deep; equipped with machinery for hoisting. Mine ventilated by a fan which was expending power and giving poor results, owing to the small air-ways and the long distance the air had to travel. Measurement of the air was taken in two places, and not half the quantity was circulating through the mine as required by law. Instructions were given to company to clean up the air-ways, and put more air in the mines. Safety-catches were not in working order, and the mine was in very bad condition and had been badly managed. Coal 3 feet in thickness; worked on the room-and-pillar system. The pay for mining is 70 cents

per ton in winter, and 57½ cents in summer for run of mine. About 45 men employed.

Wear Coal Co.—A. B. Kirkwood, superintendent; John Kirkwood, foreman. Mine located a half mile west of Minden, connected with the K. C., Ft. Scott & M. R. R. Coal is hoisted by steam power through a shaft 45 feet deep. Ventilation is produced by a fan, giving very fair results. Measurement of the air was taken on return air-course, and 11,700 cubic feet of air per minute was passing, which was divided into four splits, and circulated around the mine in four different currents. Mine is worked on room-and-pillar plan; coal 3 feet thick.

The pay for mining is 70 cents per ton in winter and 57½ cents in summer for unscreened coal. This mine is very dry, and considerable powder is used. Shot-firers are provided by the company to fire shots after the miners leave the mine. About 75 men employed. Coal consumed in the northwest.

There are several other mines in the vicinity of Minden, operating in a small way, to supply local trade through the fall and winter.

LAMAR POSTOFFICE.

There are quite a number of mines in the vicinity of Lamar operated by different parties through the fall and winter to supply local trade. Following is a list of the names of some of the parties who operated last year, with a description of the mines:

W. S. Bacon—Drift opening; coal 12 inches thick and worked on the room-and-pillar plan. Operated in winter to supply local trade.

H. Belper is operating a drift mine on Wilson Clark's land. Coal 14 inches thick. Coal mined for home demand.

Wilson Clark—Drift opening. Coal 16 inches thick, of extra good quality. Operated in fall and winter.

LIBERAL POSTOFFICE.

Betz Bros.—Mine located near Liberal. Slope opening. Coal 30 inches thick. Coal consumed at Liberal and vicinity.

Larry Bros.—Operate a mine on the land of the Boulware Bros. Drift opening. Coal 28 inches thick, and worked on room-and-pillar plan. Operated in fall and winter to supply home demand.

Hefton & Brown—Drift opening. Operated in fall and winter to supply local trade.

Liberal Coal Company—J. G. Todd, manager. This company was operating two mines near Liberal during last winter, but one of the

mines caved in and was abandoned, and only one mine was in operation on date of inspection, Feb. 14.

This mine is a drift opening, with entrance in the side of a hill and with shipping facilities over the Mo. P. R. R. Ventilation was deficient; in fact, there was no ventilation in the mine, nor any system of ventilation adopted. Mr. Todd was instructed to clean and enlarge the airways and erect a furnace, so as to get the required quantity of air to the mine, which was promptly complied with. The coal is 34 inches thick and worked on the room-and-pillar plan, giving employment to 30 men. Coal is consumed at local points along the line of railroad.

BATES COUNTY.

Production, 627,514 tons.

For several years Bates county has been in the lead in the coal production of the State, but for the year ending June 30, 1892, she was forced to take second place on the list, having been supplanted by Macon county. The output of coal in Bates county has decreased during the past year as compared with the preceding year; this is due to the larger mines having worked out the coal deposits and abandoned the mines.

During the year ending June 30, 1893, Bates county shows an output of 627,514 tons of coal mined, and \$700,562.56 received for same at mines. While the total coal mined is 32,410 tons less than previous year, yet the amount received for this year's product exceeds that of the past year by \$635.21.

To produce this amount of coal, 1231 miners were employed during the winter months and 1001 during the summer; the number of mules worked in the mines in winter averaged 111, and in summer 92; the total number of mines operated is shown to be 43, of which 5 are shafts, 18 are slopes and 20 are strip-pits. As compared with mines operated the previous year, there is shown to be an increase of 3 slopes for this year and a decrease of 1 shaft, 5 drifts and 6 strip-pits; there is shown also to be a decrease of 7 furnaces and an increase of 5 fans.

The total number of kegs of powder used for the year was 23,696, an increase of 372 kegs over previous year. The average number of tons of coal mined per keg of powder is shown to be $26\frac{1}{2}$ tons, as against $28\frac{1}{2}$ for previous year. The average cost per keg of powder has been 25 cents per keg less for this year than for the past year, showing that as the cost of powder decreased, an increased amount of same was used in securing same amount of coal.

The most productive mines are located in the vicinity of Rich Hill, although mining is prosecuted at Amoret, Foster, Hume, Rockville and Worland. The most of the coal is taken to market over the Missouri Pacific railway, which passes through the center of the coal field.

Following is a description of the principal mines and a statement as to the condition of same as they were found at dates of inspection :

AMORET POSTOFFICE.

Blue Lick Coal Co.—George W. Bozzell, superintendent. This mine is located 3 miles southwest of Amoret ; the coal is taken to the railroad track over a tram road a mile long and loaded on cars ; slope opening ; coal three feet thick, and worked on room-and-pillar system. Mine filled up with water in March and abandoned.

Dennis Miller operates several strip-pits in the neighborhood of Amoret, and ships the coal to market over the K. C., M. & F. S. R. R. to Kansas City.

Thompson Coal and Feed Co.—F. H. Thompson, superintendent. This company operates two drifts—Nos. 1 and 2 - located four miles south of Amoret, and called the Sandy Creek mines. Ventilation is produced by a furnace, giving good results at date of inspection, April 15. Coal 3 feet thick, and worked on the room-and-pillar plan ; an average of 20 men are employed. Coal consumed at Kansas City.

Vance & McNally are operating the McGailey & Brown mine, near Amoret. Slope opening ; coal 3 feet thick and worked on the room-and-pillar plan, employing from 8 to 10 men, shipping the product to Kansas City.

FOSTER POSTOFFICE.

The coal in the vicinity of Foster is about 3 feet in thickness, with a very shallow covering, making underground mining impracticable. T. Ehart is operating strip-mines on the land of Darby & Jennings ; the product is shipped over the Missouri Pacific railway to Kansas City.

A. Skillman operates strip-mines near Foster, shipping the coal to Kansas City over the Missouri Pacific railway.

HUME POSTOFFICE.

Deering & Johnson are operating strip-mines at Hume ; the coal is about 30 inches thick, of good quality, and shipped over the K. C., F. & M. R. R., finding a ready market at Kansas City.

E. H. Thurman operates a strip-mine in the vicinity of Hume.

RICH HILL POSTOFFICE.

Rich Hill has of late years become noted for its large and valuable coal deposits. A few years ago the eyes of Eastern capitalists were turned toward this extensive coal-field, and a large amount of money was invested in developing the black diamonds. Mining is progressing very rapidly at this place, and an enormous amount of coal has been mined since the opening of these mines. The principal factors in developing and operating this vast coal-field are the Rich Hill and Keith & Perry Coal Cos., although several other smaller companies are operating mines successfully. The coal is found in local deposits (or pockets) and running very irregular, and a large amount of money is spent here yearly in prospecting for these coal deposits, testing their thickness and locating their inclinations and croppings. The thickness of the coal around here will average from 4 to 4½ feet, and the price for mining averages about 50 cents per ton the year round in the mines south and 51½ cents in the mines north of Rich Hill for unscreened coal. All the mines are worked on the double-entry room-and-pillar system, and the coal is mined by blasting. Following is a description of the mines and a statement as to their location and condition, as found at dates of inspection, first in February and again in May:

Wallace Bruce—Mine located northwest of Rich Hill. Drift opening from bottom of an old strip-pit. Ventilated by a small furnace. Coal 4 feet thick, worked on room-and-pillar-method. Mine dry and in very fair condition. The coal is hauled in pit cars about a mile to the K. C., Ft. S. & M. R. R., over which it is shipped.

S. W. Hopkins operates a drift and a strip-pit near Rich Hill, and ships over the Mo. P. R. R., hauling the coal in wagons and loading on cars. Mine operated only in winter.

Martin, Gee & Ferguson—Mine located north of Rich Hill (formerly operated by Hines Bros.) Coal is brought out through a drift. Mine very wet and roadways in poor condition. Nature furnishes what little air may be found in this mine, and when the wind changes its direction outside, the current changes inside, and where there is no wind; there is no ventilation. However, an air-shaft had been sunk, but no entry as yet had been driven toward it; but good promises were given by the operators, that the connection would be made at once, and a furnace erected, and the mine put in better condition. There were 25 men employed at date of inspection, April 14. Coal 4 feet thick, worked on the room-and-pillar plan. Shipments are made over the Mo. P. R. R. westward, but considerable of the coal is consumed at home.

Peter Pearson operates a strip-pit near Rich Hill in fall and winter, to supply home trade.

Rich Hill Coal Co.—This company is operating quite a number of mines in the vicinity of Rich Hill, and are quite a factor in the coal productions of the State. Following is a description of their mines in Bates county, with a statement as to their condition as found at each inspection :

Maj. R. M. McDowell of St. Louis is general manager, and Mr. J. T. Ravley, of Rich Hill, general superintendent.

Mine No. 2 is located one mile north of Rich Hill. First inspections of this mine was made February the 11th, and found in good condition. The shaft is 32 feet deep; machinery is used in hoisting; ventilation is furnished by a 10-foot fan, and a very large volume of air was passing through the mine, which was well conducted around the workings. Second inspection was made May 8, at which time nearly all the men were found drawing back pillars, preparatory to abandonment of the mine. Mr. George Maylin is foreman of this mine.

Mine No. 4 is a slope, located 3 miles northwest of Rich Hill. Formerly this mine was operated under contract by Thos. Graham, but on the first of November, 1892, the Rich Hill company took charge, and it is operating the mine at present. The work was confined mostly to drawing pillars at date of inspection, April 13, but several rooms were yet working on the south side. Ventilation was very fair, but roadways wet in places. This mine has an under-ground connection with No. 2, and is nearly worked out, and liable to be flooded with water and abandoned at any day. William H. Bowen, foreman.

Mine No. 13, Wm. Green foreman. This mine is located 5 miles northwest of Rich Hill. Shaft 60 feet deep, hoisting by steam-power. A careful inspection was made of this mine, February 11, and it was found that all the coal had been worked out on the east side of the shaft, and at the time work was confined to the west side. Ventilation was very good considering the long distance the air had to travel. Since our visit to the mine, an air-shaft has been sunk at the face of the workings, and used as a down-cast, carrying the fresh air direct to the men.

The coal is from 4 to 4½ feet thick, worked on the room-and-pillar method. The mine is making considerable water at present; two large pumps are kept at work night and day to keep it down. About 80 men employed. The roadways were found in very good condition.

Mine No. 14 has been worked out and abandoned; the plant and houses have been moved to Mine 17, south of Rich Hill.

Mine No. 15 is situated 2 miles south of Rich Hill. E. Allison, foreman.

This is undoubtedly the best equipped mine in the State, as the largest producer. The machinery is all in first-class order, the safety appliances in good repair. The top buildings are constructed after the most approved plans and with a view to convenience. A systematic plan of working is discovered on every hand. Tracks are laid upon which to load different grades of coal. The house is well constructed, with revolving screens to clean the

The shaft was sunk in January, 1891, and a 4-foot vein of coal was struck at a depth of 106 feet. Two inspections of this mine have been made this year—the first on February 10, when the mine was running to its full capacity, putting out about 900 tons per day and employing 240 hands. The mine was ventilated at that time by a fan, which was removing 38,250 cubic feet of air per minute, and the air was well conducted around the workings. On first inspection the inspector found the air divided into 4 different splits, each division ventilating a different part of the mine and returning over the over-cast to the shaft. The ventilation was found above the requirements of law in all parts of the mine.

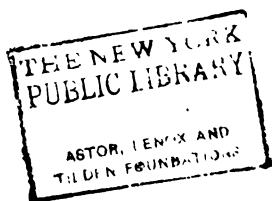
Second inspection was made May the 6th, and we found a new fan had been erected in place of the 10-foot fan that was in use at first inspection. A careful examination was made of all parts of the mine and it was found in good condition. The southwest entries gave off some gas when ahead of cross-cuts. Simeon Bramlett was killed by the gas on the morning of May 3, by going to face of the entry without the gas with a naked light. On this inspection the air was well divided into six splits and well distributed around the mine. Measurement of the air was taken near the upcast, and 54,440 cubic feet of air was found passing. There were 266 men and boys in the mine on this day, and the capacity of the mine had been increased to 1200 tons per day.

A very large amount of powder is used in this mine, but every precaution is taken to avoid accidents, and the safety of the mine is well looked after. Shot-firers are employed by the company, and no shot is allowed to be fired until all the men are out of the mine. Firemen are also employed, whose duty it is to go around the workings and examine all places and report to the foreman before the mine is allowed to enter the mine.

The mine is comparatively dry, with good high roadways in good condition. (Embodied in this report will be found a correct description of this mine.) The coal is from 4 to 4½ feet thick, worked on the end-and-pillar method. The most of the product from these mines is consumed by the Mo. Pac. R'y Co., but considerable coal is also shipped to points south and west.

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to points south and west.

Mine No. 18 is located one mile south of Rich Hill. Drift opening, which was started from the bottom of a strip-pit. The coal is brought out by machinery, then hauled over an elevated trestle to where it is dumped on cars. This is a new mine, opened out last March, and the work was confined to entry-driving at the date of inspection, April 14. There was no railroad connection at that date with the mine, but we are informed that a switch has been built by the Mo. P. R'y. The coal is about $4\frac{1}{2}$ feet thick, with very fair roof.

All the mines of the Rich Hill Coal Co. are connected with the Mo. P. R'y by switches, and the product of the same transported over its lines.

Contract mine, operated by Simeon Jay, is situated 4 miles northwest of Rich Hill; mine entered through a slope, and steam-power used for hoisting; ventilation is furnished by a fan, doing very little good, and the mine found poorly ventilated. Cross-cuts between entries were found open, and the air lost before it reached the face of the workings, and the men found suffering in all parts of the mine. The attention of Mr. Jay was called to the deficiency, and he requested to remedy the evil at once and put his mine in better condition. In a few days after our visit to the mine we received a letter, stating that the mine was filled with water, and Mr. Jay had left between two days, without paying his men. We have been informed that the Rich Hill Coal Company has taken the water out, and that the mine was leased to D. I. Rees, who operates it at present.

Contract mine, operated by J. M. Wise, is located about 3 miles from Rich Hill; slope opening, with steam-power used for hoisting, draining and ventilating. The mine was found fairly ventilated, and in very good condition. The heavy rains last spring had caused considerable damage to the mine by water flooding in from caves and low places. The coal is from 4 to $4\frac{1}{2}$ feet thick, with very good roof. From 30 to 40 men are employed. Coal consumed at points west.

Wm. Sullivan is operating a drift and strip-pit one mile south of Rich Hill, transporting his coal over the Mo. P. R'y, which is consumed at points west.

WORLAND POSTOFFICE.

There is a very large amount of coal mined in the vicinity of Morland, but most of it at strip-pits. The covering over the coal in this vicinity is so shallow as to make underground mining impracticable as well as unprofitable.

Thomas Manchester & Son are operating a mine east of Worland; slope opening; coal 3 feet thick, worked on the room-and-pillar plan, employing a few men in winter to supply local trade.

Rankin Bros. opened out a new slope last winter, and are hauling the coal in wagons to the Missouri Pacific railroad, over which it is shipped to Kansas City.

F. A. Ramey & Co.—This company operated a slope through last winter, but early last spring some of the rooms caved, the mine filled with water and was abandoned. Since then the company has sunk a shaft on the other side of the hill, where it will operate this winter; coal 3 feet thick, and worked on pillar-and-room plan. Coal consumed at Kansas City.

The following parties are operating strip-mines in the vicinity of Worland: L. Baldwin, Enterman & Bear, Springer & Gardner, Harris Bros., J. H. Johnson, J. O. Morgan, J. A. Newkirk and N. R. Vaughn. Some of the above-named parties are very large producers.

BOONE COUNTY.

Production, 25,602 tons.

The coal production of Boone county has shown a slight increase during the past year as compared with the preceding one. The county is underlaid with the coal measure formation, and coal is mined in all parts of the same, but only in a small way to supply home demand. During the past year 17 mines were operated, which produced 25,602 tons of coal, an increase over the preceding year of 4544 tons. The product was sold at the mines for \$38,365, or an average of \$1.49 per ton. Following is a description of some of the mines:

CENTRALIA POSTOFFICE.

Barron and Gooch operate a mine one and one-half mile east of Centralia. Shaft 28 feet deep; horse-power. Coal 24 inches in thickness, worked on the long-wall plan, employing about six men during the winter months to supply the home demand.

G. M. Wiley has been operating a mine on his land three miles north of Centralia during the winter months. L. Severs purchased the property this spring and is now operating same. Shaft 30 feet deep; horse-power. Coal consumed in home market.

COLUMBIA POSTOFFICE.

B. S. Benefield—Mine located 3 miles northeast of Columbia; drift. Coal $3\frac{1}{2}$ feet thick, worked on pillar-and-room-plan, and ventilated by a small furnace. Mine is operated in winter months only, to supply home trade.

Columbia Coal and Mining Co.—Mines located five miles northeast of Columbia, at Henry station, and connected with the Columbia branch of the Wabash R. R. by a side-track.

Entire product of the mine is consumed by the Wabash Railroad Company.

Shaft 110 feet deep. The coal is from 34 to 40 inches in thickness, and worked on the long-wall system.

The soap-stone forming the roof overlying this coal is very soft and difficult to keep up, requiring a large amount of timber to be used.

The ventilation is produced by a fire-basket located at the foot of air-shaft, which gives good results. The mine is dry and roadways are in good condition.

About 25 men are employed and 80 cents per ton is paid for mining.

This is the only mine in the county shipping coal by rail.

James Rouse operates a mine 3 miles distant from Columbia, supplying local trade.

W. A. Gooding & Co.—Mine located 5 miles north of Columbia. Shaft 45 feet deep; horse-power. The coal is $3\frac{1}{2}$ feet in thickness and worked on the pillar-and-room-plan.

About 20 men are employed in winter and 6 in summer. The output is consumed at Columbia and in its vicinity.

BROWN'S STATION POSTOFFICE.

Isaac Davis operates a drift mine at Brown's station; worked during winter months to supply the local trade.

M. C. Petro operates a strip-pit in the vicinity of Brown's station, supplying local trade.

John Winterholter operates a mine to supply home trade.

George Rogers operates a mine near Brown's station to supply home trade.

Charles O'Donnell operates a mine near Brown's station, employing 3 men in winter.

Walter James operates a mine near Brown's station during the winter months, supplying the local trade.

James W. Gaither operates a mine near Brown's station; works during winter months only, employing about 3 men. There are also several other local mines in this vicinity, which we had not the time to visit.

STURGEON POSTOFFICE.

Wald, Andrews & Co. have been operating a mine 3 miles southwest of Sturgeon, supplying the local demand. Shaft 115 feet deep; horse-power; coal about 20 inches in thickness, with a slate roof. Mine was abandoned early in the spring, but the company contemplates sinking the shaft to a greater depth to secure a thicker seam of coal.

J. F. Gossett—Mine located at Switzler's station. Coal consumed in the home market.

CALDWELL COUNTY.

Production, 29,020 tons.

In the report of 1892 Caldwell county ranked tenth in the coal production of the State, but in this report it will be noticed that she is forced to twelfth on the list, having been surpassed in the past year by Audrain and Linn counties.

The report of 1892 shows the output of this county to have been 38,333 tons of coal, while in this report it is given at 29,020 tons, showing a decrease of 9,313 tons. Four mines were operated during the past year, working on two different veins of coal. The Cowgill, Hamilton, and Kingston mines are working the upper vein, while the East Hamilton mine is working the lower vein, which is 507 feet deep. Following is a description of the mines and the condition in which they were found at dates of inspection:

COWGILL POSTOFFICE.

Cowgill Coal Co.—W. H. Reavis, superintendent. This mine is located 2 miles west of Cowgill, on the line of the C., M. & St. P. R. R. The shaft is 340 feet deep; steam-power is used for hoisting. The shaft was sunk as a trial one, and entries driven to test the coal, which runs very irregular, and varies in thickness from 8 to 20 inches. It is worked on the long-wall plan, with a very poor system of ventilation. Mine making considerable water. From 3 to 6 men employed.

HAMILTON POSTOFFICE.

Caldwell Coal Co.—T. W. Hines, superintendent. This mine is located 2 miles east of Hamilton, on the line of the H. & St. Joe R. R. Shaft 507 feet deep, equipped with very fair machinery to hoist, drain and ventilate the mine. Two inspections have been made of this mine during the year. First inspection was made April the 7th, and the ventilation was found deficient. The fan was setting at that date

on top of hoisting shaft, forcing the air through a chamber partitioned off the side of the main shaft, and only making 30 revolutions per minute, owing to a broken wheel in the engine that worked the fan. This deficiency was soon remedied by having a new wheel take the place of the old one. On the 20th of same month we were notified that the fan was making 90 revolutions per minute and removing a sufficient amount of air.

Second inspection was made July 11, and we found the escapement shaft completed and the fan moved to top of air-shaft, and ventilation up to the requirements of the law.

Coal 19 inches thick, overlaid with a good soap-stone roof, and worked on the long-wall plan, employing 50 men.

Hamilton Coal Co.—Jos. McCourt, superintendent, and Ralph Booth, secretary. Mine located $1\frac{1}{2}$ mile southeast of Hamilton; connected with the Hamilton & Kingston R. R.. Shaft 310 feet deep; equipped with steam plant; all the safety appliances, such as ropes, cages and safety-catches, were in good repair, and the requirements of the law closely observed. A 10-foot ventilating fan is used to ventilate the mine, and the required quantity of air was passing around the workings. The coal is from 18 to 26 inches thick, and worked on the long-wall plan; very few props are used. Some gas is found in this mine, but not sufficient to do any damage; gas-man make the rounds of the workings every morning before the miners go to their work. Mine dry and in very good condition. About 35 men employed. Coal consumed at local points along the line of railroad and at points west.

Second inspection was made of this mine July 11, and one side was found abandoned, owing to the water breaking in; otherwise mine found in good condition.

KINGSTON POSTOFFICE.

Kingston Coal Company—E. H. Johnson, president. Mine situated north of Kingston, connected with the Hamilton and Kingston R. R. Shaft 247 feet deep, equipped with first-class machinery for hoisting engine; engine-house, pit-head, tippie-house, gates, cover, cages and safety-catches were well constructed and in good repair. Ventilation was furnished by a steam-blower exhausting in the air-chamber, which was partitioned off the side of hoisting-shaft, but as soon as an escapement-shaft is sunk, a fan will be erected.

The coal varies in thickness, and runs irregular and faulty; at places 26 inches is the regular thickness, and the long-wall mode of mining is used

Coal consumed at points west.

The output was greatly diminished at this mine in the past year, owing to the limited number of men that the company was allowed to work without an escapement-shaft. It has started to sink an escape-shaft, and its output will doubtless be increased this year.

CALLAWAY COUNTY.

Production, 23,961 tons.

Callaway county is nearly all underlaid with the coal measure formation, but the coal runs thin and irregular, and crops out at low places. The same vein is worked here as that so extensively mined in Boone, Macon and Randolph counties.

The principal mine is located near Fulton, although coal is being mined at various points throughout the county. Eight mines were operated during the past year, which produced 23,961 tons of coal, an increase over the preceding year of 7410 tons. The product was sold for \$36,769, or an average of \$1.53 per ton at the mine.

Following is a description of the mines:

FULTON POSTOFFICE.

William Castle—Mine located 1 mile northeast of Fulton; drift; worked on pillar and-room plan; natural ventilation.

From 3 to 6 men are employed during the winter. Coal consumed in Fulton and its vicinity.

Fulton Fire-brick and Mining Co.—S. Threlkeld, manager. Mine located about 2 miles south of Fulton, and connected with the South branch of the C. & A. R'y by a switch. Shaft 100 feet deep. Steam power. Coal ranges from 30 to 36 inches in thickness; worked on the long-wall system, and ventilated by a small furnace, which was giving good results.

We found the mine to be dry and in fair condition, considering the character of its roof, which is a soft soap-stone, requiring the greatest care to hold it up.

Some 30 feet below the coal a fire-clay seam is being worked by the company, both the clay and coal being hoisted out through the same shaft. The clay is about 8 feet in thickness and worked on the pillar-and-room plan. Twenty-six cents per ton is paid for mining the same.

The equipment of this mine is new and in good condition. Chutes have been built to coal trains and to load the clay in cars. Steady employment is furnished to 50 men the year round. The company uses the most of its output of coal in the manufacture of fire-brick.

Harris Bros' Mine—Mine located $1\frac{1}{2}$ mile south of Fulton and connected with the South branch of C. & A. R. R. by a switch. Shaft 80 feet deep; ventilated by a furnace which was giving good results; coal 34 inches in thickness, and worked on the long-wall plan. Eighty cents per ton is paid for mining. The capacity of the mine is rather limited, and very little coal is shipped.

John Harris—Mine located 1 mile east of Fulton. Shaft 45 feet deep; horse-power; ventilated by a furnace, and worked on the long-wall system. Coal is 32 inches in thickness. One dollar per ton is paid for mining, and the output is sold in the vicinity of Fulton. The fire-clay underlying the coal is mined and shipped to manufacturers of fire-brick at Chicago and other points.

John Marsenkoff—Mine located near Fulton; drift; coal 30 inches in thickness; worked on the pillar-and-room plan; about 4 men are employed during the winter.

James Smith—Mine located near Fulton; drift; employs 5 men in winter to supply the home demand for coal.

Rufus Bishop—Mine located near Fulton; drift; coal 32 inches in thickness, and worked on the long-wall plan. One dollar per ton is paid for mining, and product sold in home market.

Mrs. Maycock—Mine located near Fulton. Worked on the long-wall plan; employing 3 men in winter. One dollar per ton paid for mining; coal sold to local trade.

GUTHRIE POSTOFFICE.

Mine located near Guthrie; drift; coal 30 inches thick; operated during the winter months to supply local trade.

AUXVASSE POSTOFFICE.

J. S. Henderson—Operates a mine located near Auxvasse; shaft 20 feet; horse-power; worked on the long-wall plan. Coal consumed in the home trade.

STEPHENS STORE POSTOFFICE.

W. M. Guy—Mine near Stephens Store; shaft 55 feet; coal 30 inches thick; mine operated during winter to supply home market.

CARROLL COUNTY.

Production, 1068 tons.

Carroll county is nearly all underlaid by the coal measure formation, but very little mining has been carried on thus far. A few mines are operated in the vicinity of Carrollton, to supply local demand. The

coal varies in thickness from 18 to 24 inches. It is overlaid with good roof, and is the same seam as that so extensively worked in Ray county.

The following parties operate the local mines: Ralph Farr operates a strip mine; David Jenkins, shaft 15 feet deep; Henry Smith, shaft 14 feet deep; Wallace & Harvey operate a shaft 15 feet deep, and work it on the long-wall plan. The product of all these mines is consumed at Carrollton. There are other mines in other parts of the county, operating in fall and winter to supply home trade.

CEDAR COUNTY.

Production, 890 tons.

JERICO POSTOFFICE.

There are several parties operating mines in the vicinity of Jerico, on a small scale, to supply home demand. The coal is found in local deposits in the hills, and the mines are entered by drifts and slopes; it runs from 26 to 35 inches in thickness, and is worked on the room-and-pillar plan; one dollar per ton is paid for mining; the coal is carried away in wagons and consumed in the surrounding neighborhood.

Following are the names of parties who operate the mines, with a description of same:

T. G. Ashenfelter, drift opening, coal 3 feet thick; employing four men to supply local trade.

J. S. Cole, drift opening, coal 28 inches thick; employing 6 men in winter to supply local demand.

A. B. Davis, drift opening, coal 30 inches thick; working on long-wall plan.

J. C. Duncan, slope, coal 26 inches thick; long-wall plan.

Wm. Packrard, drift opening, coal 24 inches.

D. M. Poage, drift opening, coal 24 inches thick.

CHARITON COUNTY.

Production, 1136 tons.

While all of Chariton county is underlaid by the coal measure formation, yet, like Carroll, the adjoining county, very little mining is carried on. A few local mines are operated in the neighborhood of Indian Grove and Salisbury in the fall and winter to supply home

trade. The coal is reported to be about 22 inches thick, overlaid with a slate roof, and is found close to the surface, which makes it convenient for strip-mining.

The following parties are operating mines in this county: Joseph Faller operates a strip-pit at Indian Grove; R. Brewer is operating a mine on John Huenten's land, drift opening; R. W. Ishe operates a strip mine near Indian Grove; W. B. Prather is operating near Salisbury, shaft 30 feet deep, hoisting by horse, employing 6 miners in winter; all of the coal mined is consumed at Salisbury. There are other local mines in other parts of the county, operating in the winter to supply home demand.

CLAY COUNTY.

Production, 7139 tons.

North Kansas City Coal Co.—Oliver C. Hutchinson, manager. Mine located at Randolph.

This mine was closed down for two years and suffered considerable damage during the time it laid idle; several places had caved in and a general squeeze had taken place all over the mine. The company commenced to reopen on the first of November, 1892, and at date of our first visit, February 6, there were 35 men at work. Shaft 430 feet deep, equipped with fine machinery, all in good order. Three boilers are used to generate steam, all in good condition; coal about 18 inches thick, overlaid with good slate roof, well adapted for the long-wall method of mining, which is used; ventilation is produced by a fan set on top of an air chamber partitioned off by the side of hoisting shaft. The ventilation was very fair, but the mine was found in bad condition. Second inspection was made May 9, and the inside workings found in poor condition and very little improvement made since our first visit. The coal is of very good quality, and is the same as that worked at Leavenworth. The output is shipped to Kansas City.

The company started to sink an escapement-shaft in January, and was down 40 feet at date of our first visit and was making good headway, working two shifts. May the 9th, on our second visit, we found that the shaft was down 175 feet, and going down very rapidly. The work had changed hands during the month of April, and very little had been done in the shaft during that month. June the 24th we visited this mine again, and found the escapement down 275 feet and going down at the rate of 4 feet per day, with 3 shifts at work, and we expect the work will be completed by the 1st of September. We also found a force of men at work repairing and retimbering the mine, which showed great improvement since our previous visits.

COLE COUNTY.

Production, 1200 tons.

Very little mining has been done in this county during the past year. Only one mine is reported as being in operation during the year, which is a shaft located near Elston station, operated by G. H. Leach & Co. to supply local trade.

COOPER COUNTY.

Production, 2892 tons.

BOONVILLE POSTOFFICE.

Very little coal is mined in this county; small local mines are operated at Boonville. The coal is only about 18 inches thick, and mines entered by drift opening.

Chas. W. Hazel is operating a slope mine near Boonville for supply of local trade.

H. W. Jenkins operates a drift mine for supply of local trade.

Leslie Smith is operating a drift mine near Boonville, employing 4 to 6 men in winter. Coal consumed at home.

A. Palmberg, mine located at Bunceton. Shaft sunk to a depth of 100 feet to reach a pocket of coal; horse-power; coal consumed around Bunceton.

Missouri Valley Coal and Mining Co.—This mine is located 4 miles west of Boonville, and connected with the Boonville & Lexington branch of the Missouri Pacific. This is a coal pocket, situated on the south side of the Missouri river. A shaft has been sunk to a depth of 65 feet, and steam plant is used for hoisting. All the machinery, ropes and cages in very good condition. There is no system of mining practiced at this mine, and much of the coal will be lost when the mine has been abandoned. It is a very large pocket of the cannel-coal variety. Mine has been in operation for a number of years. Coal is shipped to Kansas City and local towns along the line of railroad, and used in making gas. From 4 to 10 men employed. Dr. J. C. Bergher, manager.

DADE COUNTY.

Production, 6695 tons.

Coal mines have been opened and worked in this county for more than 30 years, but only in a small way to supply local trade. The coal is found in pockets and runs very irregular. It will average about 32 inches in thickness and of very good quality. It is underlaid with fire-clay mining with excellent roof over it, and worked on the room-and-pillar system. One dollar per ton for mining is paid.

All the mines are located 12 miles from any railroad, and the coal is hauled and consumed at Greenfield, Golden City, Lockwood and surrounding country. All the mines are entered by drifts.

Following is a list of names of the parties who operate mines in this county:

SYLVANIA POSTOFFICE.

I. Carson—Mine located west of Sylvania, across Horse-creek; coal 28 inches thick.

W. R. Clayton—Mine located near Sylvania; drift; coal 32 inches thick, worked room-and-pillar plan, supplying local demand.

Andrew Leonard—Mine located at Sylvania; coal 34 inches thick and worked on the room-and-pillar plan, employing from 6 to 12 men in winter.

S. McGarnvey—Mine located at Sylvania; drift, supplying local trade.

T. McOarthy operates a mine at Sylvania; coal 36 inches in thickness; employing 6 men to supply local trade.

Robt. McCluey—Mine located 1 mile south of Sylvania; coal 30 inches in thickness and worked on room-and-pillar plan, employing 6 men to supply local demand.

Ramsey & Evans operate a mine near Sylvania; coal 32 inches; employ 3 or 4 men to supply local trade.

J. R. Seaton operates a mine at Sylvania to supply the local demand.

The Zook mine is located near Sylvania and the Turman mine west of Sylvania, working the same seam of coal. There are other mines operated at Cedarville, 6 miles from Sylvania, but only to supply local demand.

GRUNDY COUNTY.

Production, 35,770 tons.

Grundy county is the eleventh coal-producing county of the State. Her output during the year ending June 30, 1893, was 35,770 tons of coal, as against 28,670 tons the preceding year, showing an increase during the past year of 7100 tons. Coal was sold at the mine at an average price of \$2.05 per ton, or a total valuation of \$73,328.50. Following is a description of the mines :

Grundy County Coal Co.—N. Shanklin, superintendent. The two mines worked by this company are the only coal mines at present operated in the county. They are both located at Trenton, and connected with the C. & R. I. R. R. by switches. The coal is 18 inches in thickness, and well adapted to the long-wall method of mining (which is used). The coal is overlaid with a black slate, which makes a most excellent roof, about 18 inches of which along the roadways has been taken down to give height to the same. The following is a description of the mines as we found them at date of inspection :

Mine No. 1 has a shaft 210 feet deep; steam-power. This mine has been in operation over 16 years, and we found the engine-house and top buildings very much in need of repairs, as well as the shaft curbing, which was in bad condition. Mine is ventilated by a 10-foot fan, which was giving very fair results considering the great distance the air had to travel through very small and narrow air-ways. Enough air, however, was passing to make good the requirements of the law, and the same seemed fairly distributed around the workings. The output of the mine is consumed by the railroad company; its trains are coaled at this mine, thus furnishing steady employment to from 70 to 80 men the year around. The mine is dry and roadways in fair condition.

Mine No. 2—Has a shaft 170 feet deep and is equipped with good machinery. The pit-head and top buildings are well constructed, and the safety appliances all found to be in good order. A 10-foot fan is used in ventilating the mine, same being set on top of the air chamber which is partitioned off from one end of the hoisting shaft. Ventilation was good at date of inspection, March 24, but no permanent system had been adopted, owing to the proposed connection to be made between the two mines to afford escapement. The thickness and character of the coal, together with the method of mining, conform to that of mine No. 1. We found the mine to be making a large quantity of water, and for a comparatively new one, its condition was rather bad. About 50 men were employed. The product is shipped to local points along the line of the C. & R. I. R. R., and to Kansas City.

HENRY COUNTY.

Production, 125,962 tons.

The coal product of Henry county has shown a large decrease during the year ending June 30, 1893, as compared with the preceding year. The entire county is underlaid with the coal measure formation, and coal is mined in all sections of the county. There are reports from 33 mines, large and small, represented in the statistical table on this county. These 33 mines produced 125,962 tons of coal during the past year, valued at \$1.47 per ton at the mine, or a total valuation of \$185,648. In producing this amount of coal 450 men were employed during the year. The principal mines are located at Calhoun, Deepwater and Lewis station. The M., K. & T. and K. C., Ft. S. & M. R'y passing through the coal field furnish good shipping facilities for the product. Following is a description of the mines:

BROWNINGTON POSTOFFICE.

Blair Diamond mines—John Thompson, superintendent. Mine located near Brownington; connected with the Bailey railroad. Shaft 50 feet deep, and product hoisted by a small engine. We made an inspection of this mine April 17, and found it in poor condition. A fan was erected on top of the air-shaft, but the ventilation was badly conducted, as air-ways were not kept open and the men were suffering for want of air. There was no system of ventilation practiced here, and very little practical knowledge of operating a mine was shown. Instructions were given to the company to improve the condition of the mine and comply with the State law. The mine is very wet and in bad condition generally. Coal 3 feet thick; worked on pillar-and-room plan. About 30 men were employed. Coal consumed mostly by railroad company.

Dunlap Coal Co.—Lee Dunlap operated a mine last winter about 1 mile from Brownington, but had it worked out at the date of our visit and the shaft abandoned. Mr. Dunlap had opened a strip mine in same locality.

Mike Odell operates a drift mine 3 miles south of Brownington, near Cooper creek, supplying local trade.

P. W. Huey operates a strip pit 4 miles south of Brownington, supplying local trade.

CALHOUN POSTOFFICE.

Calhoun Coal Co.—Moses Thompson, superintendent. Mine is located on line of the M., K. & T. R. R., 2 miles southwest of Calhoun. Shaft 32 feet deep. A small engine is used in hoisting. Inspection of this mine was made April 20, and the ventilation was found deficient, owing to small and obstructed air-ways. A fan had been erected on top of hoisting shaft, which was expending power and giving poor results, not passing half the quantity of air required by the law. We notified the company to clean and enlarge the air-courses, so as to improve the ventilation. Coal 30 inches thick; worked on the long-wall method; roof very soft in places, requiring great care to keep it secure; road-ways wet and muddy, and mine making considerable water. Thirty men employed. The coal is consumed by the railroad company. Five coal chutes have been built here to coal trains.

CLINTON POSTOFFICE.

There are several parties operating mines in the vicinity of Clinton, but only in small way to supply home trade. Following are the names of all the parties, with a description of the mines:

Wm. England—Mine located southwest of Clinton; shaft 25 feet deep, hoisting by a horse; coal 3 feet thick; worked on the room-and-pillar method. Coal consumed at Clinton.

Herring & Hess—Mine located south of Clinton, near North; drift opening. Coal hauled in wagons and loaded on cars at North switch, and shipped over the K. C., F. S. & M. R. R.

Mrs. McCloud has purchased the J. B. Kinney mine. It is a slope opening, coal 2 feet thick and worked on the room-and-pillar plan, and from 2 to 3 men employed. Coal is sold at Clinton.

B. L. Owen operates a mine near Clinton; shaft 25 feet deep, coal 2 feet thick and worked on room-and-pillar plan, employing from 8 to 10 men to supply local trade.

DEEPWATER POSTOFFICE.

Brann Coal Co., Ed. Brann, manager—Mine located 4 miles south of Deepwater (formerly operated by R. Dunham). Shaft 50 feet deep; hoisting by horse; coal 3 feet thick and worked on the room-and-pillar plan; employing from 6 to 12 men; paying 75 cents per ton for mining clean coal in summer, and 85 cents in winter. Coal is hauled in wagons a half mile and loaded on cars at Eaton switch, and same consumed at points along the line of the K. C., Ft. S. & M. R. R.

John Hurst—Mine located $3\frac{1}{2}$ miles south of Deepwater. Shaft 35 feet deep; hoisting by a horse. This shaft was sunk last fall 200 yards from the old shaft, which is used now for an escapement-shaft; coal 3 feet thick, and worked on the room-and-pillar plan; mine ventilated by a stove in an air-chamber located by side of hoisting shaft, and producing very little current in the mine; cages and all the safety appliances in poor condition, and very little attention had been paid to the mining law. Coal is hauled in wagons and loaded on cars and shipped to Kansas City over the K. C., Ft. S. & M. B. R.

J. W. Hurst—Mine located south of Deepwater; shaft 33 feet deep; horse-power; this is a new shaft sunk this spring, and the old one abandoned; the coal and system of mining is the same as that of other mines in this vicinity; coal hauled in wagons, loaded on cars and shipped over the K. C., Ft. S. & M. B. R.

Jos. and W. Hurst—Are opening a new drift in the same locality, and expect to work the same seam of coal and be ready for operation this fall.

McFadden & Co.—Mine located 3 miles south of Deepwater; slope opening, using horse-power to bring up the coal; ventilation produced by a small furnace, giving very fair results; coal about 3 feet thick; worked on the room-and-pillar plan; paying 70 cents per ton in summer, and 85 cents in winter. They employ from 15 to 20 men; hauling the coal in wagons, and loading on cars at Eaton switch, from which point it is carried to market over the K. C., Ft. S. & M. B. R.

There are other 'drift-mines and strip-pits in this vicinity, which had closed down for the summer at date of our visits; hence, no inspections were made.

Central Coal Co.—John Perry, general manager; Robert Barr, superintendent. This mine is located 1 mile east of Deepwater, and was formerly known as the Keith & Perry mine; it is connected by a switch with the K. C., Ft. S. & M. B. R. Shaft 60 feet deep; equipped with good machinery for hoisting; the pit-top and engine-house is comparatively new and well constructed; ventilation is furnished by a 14-foot fan, and it is one of the best ventilated mines in the State. The air travels from the down-cast to the face of the south entry, where it is split to east and west, making its return through the face of the workings to the up-cast, giving each man his full share. Coal about 3 feet thick; worked on the long-wall plan; paying 75 cents per ton in summer and 85 in winter for screened coal. Employment is given to from 80 to 125 men and boys. Roadways high and dry, and mine in good condition, showing that Mr. Barr, the superintendent, is a prac-

tical manager, and that he is giving proper attention to the mine. Coal consumed at Kansas City and points westward.

LEWIS STATION POSTOFFICE.

Co-operative Coal Co.—L. W. Good, president. Mine located at Lewis station, and connected with the M., K. & T. R. R. by a switch. Shaft 75 feet deep; hoisting by steam-power. Mine ventilated by a 10-foot fan, which was giving good results. Coal about 30 inches thick; worked on the long-wall plan. The company pays 85 cents per ton for screened coal, and employs from 25 to 30 men. Mine dry and in good condition. The requirements of the law observed and complied with. Coal consumed at Sedalia and points along the line of railroad.

D. B. Pigg & Co.—Mine located 1 mile east of Lewis station and $\frac{1}{2}$ mile north of the line of the M., K. & T. R. R. Coal is hauled on a tram-road and loaded on cars on main line. Drift opening; worked on the long-wall plan; coal 30 inches in thickness. From 15 to 20 men are employed. Mine not working at date of our visit, and no measurement of the air could be taken.

Tebo Coal Co.—John Bowen, superintendent. Mine located $1\frac{1}{2}$ mile east of Lewis station, on the line of the M., K. & T. R. R. Shaft 35 feet deep; equipped with steam-power for hoisting. Ventilation is produced by a furnace, which was giving very fair results at date of inspection, April 20, passing the required quantity of air around the workings.

The coal is about 30 inches thick, worked on the long-wall plan; roadways dry and mine in very good condition. From 40 to 60 men are employed. Coal consumed by the railroad company; chutes have been erected here to coal engines.

NORTH POSTOFFICE.

North Coal Company, Geo. Bogard, superintendent—This mine is located at North station. The mine had been idle during the winter up to February, when the present company leased it and commenced operating the same. Inspection was made April 19, and the mine was found in bad condition. A fan had been erected in place of the furnace, but was doing very little good owing to its indifferent construction. The air was found deficient in all parts of the mine, and the roadways wet and muddy. Second inspection was made June 19, and no improvement had been made since our first visit. Instruction was given to the company to improve the condition of the mine at once.

WINDSOR POSTOFFICE.

L. W. Beaman—Mine located north of Windsor. Shaft 40 feet deep; hoisting by horse, and ventilating by a furnace. The coal is 5 feet thick, and worked on the room-and-pillar plan. From 6 to 10 men employed. Coal hauled in wagons loaded on cars at Windsor, and shipped over the M. K. & T. R. R. to Sedalia, where it is consumed.

JACKSON COUNTY.

Production, 4819 tons.

KANSAS CITY POSTOFFICE.

Kansas City Clay & Coal Co.—John A. Gallagher, manager. This is the only mine in the county. It is located about 2 miles southeast of the city limits of Kansas City, near Brush creek; shaft 400 feet deep; steam-power is used for hoisting, draining and ventilating.

The mine is equipped with first-class machinery, the engine cylinders are 20×32 inches, connected direct to a 7½-foot drum, working on first motion. Three large boilers have been erected to supply the steam-power. The pit-head and tippie-house have been well constructed for convenience and economy in handling coal. A small fan is used at present to ventilate the mine, which was giving very fair results at date of inspection, June 12, but the mine will soon outgrow the capacity of the present one and a larger fan will be necessary as soon as the escapement-shaft is sunk and a permanent system of ventilation adopted. The mine generates considerable gas, which comes from the slate, but is soon rendered harmless as it comes in contact with the air, and we think the gas will exhaust itself and gradually diminish as the mine is extended. The coal is from 18 to 22 inches in thickness, and is worked on the long-wall plan. It is overlaid with a strong black slate, which makes an excellent roof, requiring very little timbering. The coal is underlaid with very fine fire-clay, which can be used for manufacturing purposes.

The coal is of a very good quality, and we think it the same seam as that worked at Hamilton and Trenton. The mine has good shipping facilities, and employs from 50 to 60 men. The coal finds a ready market in the city, where it is all consumed.

JOHNSON COUNTY.

Production, 12,101 tons.

Johnson county is all underlaid with the coal measure formation, and coal has been discovered in all parts of the county; but very little mining has been done. Twenty-five years ago, extensive mines were operated at Clear Fork, Carbon Hill and Montserrat, but all were abandoned before one-tenth of the coal was worked out, owing, we suppose, to its inferior quality. There are a few mines operating at Montserrat and Warrensburg in the fall and winter to supply home trade. The only mine in the county with shipping facilities is located at Knob Noster. During the past year, 12,101 tons of coal were mined, as against 10,485 the preceding year, showing a slight increase of 1616 tons. Following is a description of a few of the mines:

KNOB NOSTER POSTOFFICE.

Thos. Boyd & Son—Operate a mine 1 mile southwest of Knob Noster and 1 mile from railroad. The coal is hauled over a tram-road and loaded on cars and shipped over the Mo. P. R. R. Shaft 65 feet deep, using steam-power for hoisting.

The mine was found in poor condition, and badly managed. Ventilation was found deficient, and the requirements of the mining law badly abused. The attention of Mr. Boyd, proprietor, was called to the deficiency, and he requested to procure better ventilation and safety in general to his employes.

Some 20 men employed at date of inspection, April 29.

MONTSERRAT POSTOFFICE.

P. D. Fitch—Mine located 3 miles south of Montserrat. Slope opening. Coal 30 inches thick and worked on the room-and-pillar plan, employing about 6 men in winter. Coal consumed at Sedalia and other towns along the Mo. P. R'y.

J. C. Harris is operating a mine at Bristol Ridge. Slope opening. Coal hauled in wagons to Montserrat and Warrensburg.

J. J. Harding—Mine located at Bristol Ridge. Supplying local trade.

Jos. Murley—Mine located 4 miles south of Montserrat. Slope opening. Coal hauled in wagons and shipped over the Mo. Pac. to Sedalia.

WARRENSBURG POSTOFFICE.

Some mining has been carried on at Warrensburg for over 30 years to supply home demand. The coal varies in thickness from 18 to 24

inches. It can be found in all the hills around the vicinity of Warrensburg, and is of good quality for domestic purposes.

Following are the names of the parties who are operating mines in this neighborhood :

D. A. Bullock, P. H. Bullock (operating the Shaffer mine), L. M. Herrington, W. B. Meiley, Madison Murray, Henry Lamers, W. L. Ronemous, W. B. Stealey, E. H. Queener, and Ben. F. Wood, who has just opened out a new mine northwest of Warrensburg.

LAFAYETTE COUNTY.

Production, 363,928 tons.

Lafayette county is the oldest coal-producing county in the State, as well as one of the largest producers.

While the coal seam is only 18 inches thick, yet the nature of the roof, mining quality of the coal, the economic mode of working, with the short haul to market, are such that it enables the operators of this county to put their coal on the market and compete with coal companies from other parts of the State where a thicker vein is mined.

The total output of coal for the the year ending June 30, 1893, amounts 363,928 tons as against 347,600 tons the preceding year (showing an increase for the past year of 16,328 tons), which was sold for \$539,528.31, or at an average price of \$1.48 per ton at the mines. The number of men employed in the mines averaged 1409 during the winter, and 810 in the summer season. The number of mules worked in the mines averaged 30 in winter and 24 in summer.

The number of mines operated during the past year was 48, of which 26 are shafts, 5 are slopes, and 17 are drifts. At eight of the mines steam-power is used, and at 19 horse-power is employed. There are 5 fans and 28 furnaces used for ventilation; 15 of the smaller mines have no ventilating appliances. The system upon which the mines of this county are operated is confined almost exclusively to the long-wall plan, for out of a total of 48 mines, only 4 are worked on the pillar-and-room method. The largest mines are located at Corder, Dover, Higginsville, Mayview, Napoleon, Waverly and Wellington, and the product from which is transported over the C. & A. and Mo. P. R'y., to Kansas City and other points west.

Following is a description of the principal mines, together with a statement as to their location and condition as found at date of inspection :

AULLVILLE POSTOFFICE.

E. P. Crumpley operates a mine located near Aullville, employing a few men during the winter months to supply the local demand. The coal is about 18 inches thick, worked on the long-wall plan, and it is the same seam as that so extensively mined in other portions of the county.

CONCORDIA POSTOFFICE.

Mining in the vicinity of Concordia is limited to the supply of local demand only. The coal ranges from 18 to 22 inches in thickness, and is worked on the long-wall plan. The following parties are operating in a small way :

John Franke, James Hendricks, Wm. Rowe, Albert Kreese, Robert Krampf, John Dohrman, C. Shelton, and M. Roach (colored) operating the Schroeder bank.

CORDER POSTOFFICE.

Corder Coal and Coke Co.—H. G. Smith, superintendent. Mine is located on the west side of Corder, and connected by a switch with the Chicago & Alton railroad. Shaft 90 feet deep, with steam-power employed for hoisting and operating the fan. Ventilation is furnished by an 8-foot fan, giving good results. A large volume of air was being conducted around the face of the workings. Mine is worked upon the long-wall plan, in circular form, with movable face track. Coal is 18 inches thick, with a good roof. A layer of slate 10 inches thick comes down with the coal and is utilized in building pack-walls for support of the roof. The roadways are high and fairly well drained, and altogether the mine may be said to be in very good condition.

The coal is shipped to Kansas City and points west.

This company is about opening a mine one-half mile west of the old one. The shaft is down 72 feet and horse-power used in hoisting. An underground connection will be made with the old mine for an escapement, and both mines will be worked in one breast. The new mine will be ventilated by a furnace set on top of shaft and exhausting through an air-chamber, partitioned off from the side of hoisting shaft. Of its kind the arrangement for hoisting and ventilation is very good.

At date of inspection, June 10, a few men were employed driving entries. At present the coal is being hauled away in wagons, but eventually the mine will be connected by a switch with the C. & A. R. R.

W. H. Bell operates a mine 1 mile south of Corder. Shaft 22 feet deep; horse-power. A few men are employed during the winter months to supply local trade.

John Espland operates a mine north of Corder; coal consumed by local trade.

DOVER POSTOFFICE.

Dover Coal Co.—T. Davis, superintendent. Mine located on the Boonville and Lexington branch of the Missouri Pacific R. R., about 2 miles northeast of Dover. It is a drift opening at an elevation of 100 feet above the railroad. Ventilation is produced by a furnace, which was giving good results. Coal about 20 inches thick; worked on the long-wall method; roadways were wet and mine making considerable water. About 35 men are employed; coal shipped to points west.

Thomas Spruill operates a mine east of Dover, most of the product being consumed by steam-boats.

N. F. Fox operates a mine 2 miles east of Dover; drift; product sold to the local trade.

HIGGINSVILLE POSTOFFICE.

Higginsville is situated 12 miles east of Lexington, and is surrounded by coal mines, all of which have good shipping facilities, as the C. & A. and Mo. Pac. R. R. both reach this point.

The Bonanza Coal Co.—Mine located 2 miles east of Higginsville, on the line of C. & A. railway. Shaft 70 feet deep; horse-power. On our first inspection, February 20, we found ventilation deficient, and the miners suffering for want of air. The appliances here used for ventilating the mine we discovered to be a little fire set on top of the ground, with an area of 2×4 for the air of the mine to pass through. We notified the company at once of the deficiency in quantity of air, and ordered a furnace built in the bottom and a smoke-stack erected high enough above the buildings of the pit-top to cause the furnace to draw. May 11 we made another visit to this mine, and was pleased to find that our instructions had been carried out, and as a result ventilation was good. The coal is 17 inches thick, worked on the long-wall plan, and miners paid \$1 per ton for mining. About 40 men are employed. The output is shipped over the C. & A. to Kansas City.

J. D. Bruce—Mine located 1½ mile southwest of Higginsville, connected by switches with the C. & A. and Mo. P. railways. Shaft 25 feet deep; horse-power. Ventilated by furnace and worked on the long-wall plan. From 30 to 40 men are employed, and the product is shipped to Kansas City.

Campbell mine—Thomas Thomas, superintendent. Mine located near the west city limits of Higginsville, and connected with the C. & A. R. R. by a switch. Shaft 70 feet deep; equipped with machinery for hoisting and ventilating. This mine is well ventilated, a large volume of air being forced around the entire working face. Road-ways are high and dry, and mine in good condition. Coal is 17 inches thick; worked on the long-wall system, and about 65 men employed. The output is shipped to Kansas City and northwest points.

Frank Coleman operates a mine 2 miles southwest of Higginsville, working two or three men in winter to supply local trade.

Farmers' Coal and Mining Co.—J. H. Campbell, president; Thos. Thomas, superintendent. Mine located 1 mile south of Higginsville, and connected with the C. & A. and Mo. P. R. R. by switches. Shaft 36 feet deep; horse-power. Ventilation is produced by a furnace. Mine well ventilated, and in good condition. An underground connection will soon be made with the Campbell mine, so as to have the coal of both mines on one face. About 50 men are employed. Coal consumed in Kansas City and points west.

Chas. E. Duncan operates a mine 2 miles southwest of Higginsville. Drift opening; worked on long-wall plan, and ventilated by a small furnace; from 6 to 8 men are employed during the winter months to supply the local demand.

Haygood Coal & Mining Co.—J. E. Gunn, manager. The mine is located on the same coal switch as that used by the Farmers' Coal Co.; half mile northwest of the latter and 2 miles southwest of Higginsville; shaft 19 feet deep; horse-power; from 15 to 20 men employed. Coal is of the same thickness and worked on the same plan as other mines in the vicinity; mine fairly well ventilated, but very wet, owing to the shallow cover; coal shipped to Kansas City.

John Longest operates a mine 2 miles southwest of Higginsville. Drift opening; worked during the winter months to supply the home market.

Frank Kester—Mine located 3 miles southwest of Higginsville, on Meinerhagan's land; shaft 80 feet deep; horse-power; from 4 to 6 men are employed during the winter months to supply local trade.

Rocky Branch Coal Co.—This company operates two mines, both of which are located on a switch having connection with the C. & A. and Mo. Pacific R. R. Each have drift openings, with under-ground connection between the two mines

We found one of the mines closed down at date of inspection, owing to the depression in trade. The mines were found well ventilated, dry and in good condition. Coal 17 inches thick, and like all other

mines in this locality, worked on the long-wall plan. The pay for mining is $4\frac{1}{2}$ cents per bushel in winter and $3\frac{1}{2}$ cents in summer. From 40 to 60 men are employed. Coal shipped to points west.

Stealey & Fowler Coal Co.—G. W. Stealey, manager. This company is operating three mines, and all have shipping connection with the C. & A. and Mo. Pacific R'ys. Mines are located about a half mile apart, and two miles west of Higginsville.

Mine No. 1 has shaft 15 feet deep; horse-power, and ventilated by a small furnace. Mine at date of inspection was found well ventilated, dry and in good condition, but we were informed that considerable water is encountered during a rainy season.

The thickness of the coal, mode of working and price paid for mining is the same as that of other mines in this locality. About 30 men are employed. All coal shipped west.

Mine No. 2 is a shaft 19 feet deep, horse-power, and ventilated by a furnace, which was furnishing sufficient quantity of fresh air around the workings.

About 30 men are employed.

Mine No. 3—Drift opening; operated only in the winter months. A contract was made with 10 Bohemians to load coal on cars at a given price. Mine is worked on small scale and not in good condition.

J. W. Tate—Shaft 45 feet deep; located at Higginsville. The mine has not been in operation this year, and we were informed that it was filled with water.

J. Taggart operates a small mine northeast of Higginsville, supplying the local trade.

J. A. Wilkes—Mine located 1 mile west of Higginsville. Shaft 70 feet deep; horse-power. This mine, while located on the line of the C. & A. R. R., yet has no shipping connection with it, and though supplying only the local demand, makes a good showing of its output for the past year.

Ventilation is produced by a furnace, which was giving satisfaction.

From 25 to 30 men were employed, and the product sold in the vicinity of Higginsville.

James Wright—Mine southwest of Higginsville. Shaft 17 feet deep. Operated in winter months only to supply local trade.

The Y. S. A. mine, formerly known as the Windsor mine, is located on the line of the Chicago & Alton railroad, 2 miles west of Higginsville. Shaft 45 feet deep; steam-power. It is the oldest mine in this section of the county. It is and has been extensively worked, and at present very much in need of repairs. The shaft curbing is so pressed

out into the shaft as to cause the cages to rub as they pass up and down. Mine is ventilated by a furnace which is inadequate to the production of the required amount of air. This is due to the small area between the furnace and the air-shaft, and the long distance the air is compelled to travel around the workings. At our suggestion, Mr. W. J. Ballew, superintendent, promised to make several changes during the summer when trade slackened up. Chief among the changes will be the sinking of a new air-shaft; the construction of a larger furnace, splitting the air-current into different sections, thus shortening the distance and creating a purer air; and retimbering the shaft. The machinery and all other conditions aside from that already referred to was found satisfactory. About 40 men are employed.

LEXINGTON POSTOFFICE.

Lexington is the oldest mining town in the State. Mining has been prosecuted in its vicinity for over 40 years, and the output of coal is yearly increasing. While the coal seam is only about 20 inches thick, yet it runs unbroken, or nearly so, through the entire county. There are 15 mines in the immediate vicinity of Lexington, giving employment to about 800 men in winter, and about 500 during the summer months. All the coal mined at this point, with the exception of the home demand, is shipped over the Missouri Pacific railway to Kansas City and points further west. Following is a description of the several mines and their location, together with statement of the condition in which we found them on our tour of inspection, March 16 to 19:

Bell & Greer—Mine located near Lexington; drift opening; ventilation secured by a small furnace, but sufficient for the capacity of the mine; from 8 to 12 men are employed in supplying the home demand. Mine idle at date of inspection, February 18.

Mike Holwell sunk a shaft and opened up a mine last winter at Lexington; shaft 60 feet deep; horse-power; from 6 to 10 men employed during the winter months to supply the local demand. An escapement-shaft will be sunk this summer.

T. S. Kelly—Drift opening, ventilated by a furnace; ventilation good; mine dry and in good condition; coal 17 inches in thickness, and worked long-wall. The pay for mining in winter is 4 cents per bushel, and in summer 3½ cents. From 8 to 12 men are employed. Coal is sold in the home market.

Lafayette Coal Co.—W. F. Kerdolff, superintendent; James Doran, foreman. Mine located on the south side of the Missouri river, 4½ miles east of Lexington, and is connected with the Missouri Pacific R. R. by a switch.

The mine has been poorly managed; roadways very low and wet; ventilation defective. There were 60 men at work at date of inspection, February 15, with only 3900 cubic feet of air passing per minute. An air-shaft had been sunk on the east side, but was not opened up wide enough to permit a sufficient volume of air to pass through. A small fire was built on the bottom to aid ventilation, but was doing no good. Mr. Kerdolff, superintendent, was notified of the deficiency of air, and was requested to enlarge the air-shaft and erect a furnace that would ventilate the mine in accordance with the law; and we are pleased to be able to state that our request was promptly complied with.

Coal is shipped to Kansas City and points west.

Henry Macey—Mine located 2 miles west of Lexington; drift opening; connected with the Mo. P. R'y by a switch. Ventilated by a furnace, which at date of inspection, made February 16, was giving poor results; only about half the quantity of air required by law was found to be passing. Mr. Macey was notified of this and requested to enlarge his furnace. It is our pleasure to state that this request was promptly complied with. Coal 18 inches thick and worked long-wall.

From 30 to 40 men are employed. Coal shipped to Kansas City.

A. O'Malley—Mine located southwest of Lexington; shaft 25 feet deep; horse-power; ventilated by a furnace. The mine is in good condition, and employs from 6 to 12 men. Product is confined to local trade.

J. C. McGrew operates two mines 4 miles west of Lexington, each connected by a switch with the Mo. Pac. R. R. Both mines are being worked on the same coal face, and, in fact, might be called one mine with two openings. Both have drift opening, and are ventilated with the same fan, which is set at a short distance west of the mines, exhausting through still another opening. The air enters at mine No. 1 and travels along the face of the workings, thence to the fan. We found at date of inspection, Feb. 16, the ventilation to be good, with one exception, and this was quite annoying to the miners. It appears that the fan is stopped during the night, and in the meantime, black damp accumulates in the mine, which the miner encounters each morning before the pure air is thoroughly circulated. Fruitless efforts have been made to remove this evil.

The character of the coal, mode of working and the price for mining is the same as that which obtains at other mines in this locality. The mine was found to be dry and in good condition except in matters referred to. From 80 to 100 men are employed. Product is shipped to Kansas City.

S. Spruce operates a mine east of Lexington ; drift opening. Coal sold to local trade.

Thomas Walton—Mine half mile east of Lexington ; drift opening. Ventilation was found deficient on first inspection, but this was remedied and found good on our second visit. Eight men find employment here in supplying the local trade.

Lexington Coal and Mining Company—Maj. R. M. McDowell, general manager, M. W. Serat, superintendent. The mines of this company are located along the river east and west of Lexington, and connected with the Mo. P. R'y by switches. The mines are all worked on the long-wall system, and the pay for mining is at the rate of \$1.00 per ton in winter and 87½¢ in summer. The coal in the mines of this company is about the same thickness as that of the other mines in this district, except that found in the one known as the McDowell shaft, east of Lexington, which runs a little above the average.

These mines, like all others in the county, work on the long-wall system, because the conditions are so well adapted to this method. A large block of slate falls with the coal, and is used to good advantage in building pack-walls, as no props are used. The product from these mines is very nearly all consumed by the Mo. Pacific R. R. Co.

The following is a description of the several mines of the company as found on our first inspection :

McDowell—Shaft, located 1 mile east of Lexington, 55 feet deep ; ventilated by a 10-foot fan, which was removing 17,380 cubic feet of air per minute, which appeared to be well distributed around the workings. Roadways high, mine dry and in good condition, with every indication of good management. There were 100 men employed at time of our visit.

Riverton No. 1—This mine is located 2 miles east of Lexington, and is very extensively worked. Main entries running south and cross entries east and west, all connected in a circle, with 5000 feet of face, all abreast. Ventilation was being produced by a furnace, located in the first east entry, which was removing 14,700 cubic feet of air per minute around the face of the workings. Roadways are high, the mine dry and in good condition.

Riverton No. 2—This mine has an under-ground connection with No. 1, and is at present only used as an inlet for the air, otherwise the mine may be considered as having been abandoned since spring, owing to the coal cropping out and the enlarged capacity of Mine No. 1, which absorbed all labor in No. 2. At date of our visit 125 men were employed.

Graddy mine—Drift opening, located 2½ miles west of Lexington. An electric mining plant was placed in this mine November, 1892, at a cost of \$20,000. The machinery consists of 2 boilers, one 150-horse power Ideal engine, one 150-horse power Sperry dynamo, 6 Sperry long-wall mining machines. Substantial brick buildings were erected for this plant, and up to January 31 of this year the experimental working of the new machinery has proved satisfactory. At our request for a statement of the actual work done in the mine by the above mentioned machine, Mr. Serat kindly replies in substance as follows:

Up to Jan. 31, 1893, only two machines had been introduced, and the cutting had averaged 353 feet per day; our reckoning of days embraced, however, many fractional parts of a day, and the estimate, if reduced to full-days' work, would somewhat increase the average cutting. The undermining of the mine is unusually hard, and for that reason the machines were put in. A machine will weigh 2800 pounds, occupying a space equal to 26×26 in. + 6 feet long, and requiring 4 men to serve it. The supply of power has been ample, continuous and free from interruption of any kind. As this is an entirely new enterprise in this region, all employes have required the necessary education and experience, but the results thus far have been encouraging. It is too early to enter into the details of cost, for the reason that the work has not yet passed the experimental stage. We will be glad at a future date to write more fully concerning this enterprise.

This mine is ventilated by a furnace, which was proving satisfactory, as a large volume of air was being caused to pass around the face of the workings. Road-ways high; mine dry and in good condition. Forty men were employed. J. Rosswell is the foreman at this mine.

Hackett mine—Drift opening; located 2 miles west of Lexington and a half mile east of the Graddy mine. Ventilation is produced by a 10-foot fan with good results; road-ways high; mine dry and in good condition. About 50 men are employed. J. Rosswell is foreman of this mine also.

MAYVIEW POSTOFFICE.

Matthews Coal Co.—W. B. Wilson, president. Mine located on the C. & A. R. R., 1 mile east of Mayview. This was formerly known as the Mayview Coal Co. Shaft 105 feet deep; steam-power used for hoisting and draining; mine ventilated by furnace located at bottom of hoisting shaft. The air is divided into two currents, one being forced around the workings on the east side and the other to the west side, and meet at the up-cast. At the date of inspection, May 10, machinery, cages, ropes and safety-catches were found in good order. Ventilation was also good.

The coal is 17 inches thick and worked on the long-wall plan; 45 men are employed. Coal is shipped to Kansas City.

Same company have sunk a shaft one-fourth of a mile west of Mayview, striking the same seam of coal as that worked in other parts of the county at a depth of 132 feet. This mine will be equipped with steam-power for hoisting. A pair of engines, 8×12-inch cylinder, connecting direct on a 4½-foot drum, have already been set. The machinery was made by the Keystone Iron Works, Kansas City, Mo. A new boiler has been put in, and the pit-head and tip-house are in process of construction.

Railroad chutes will be built to coal trains and an escapement-shaft will be sunk at once. In order to be ready for the fall and winter trade, work will be pushed rapidly. The coal at this shaft is reported to be 18 inches thick.

J. J. Norfleet operates a mine northeast of Mayview. Shaft 28 feet deep. Worked in the winter to supply home trade.

July 3 we were informed that the Serat Bros., of Kansas City, were sinking a shaft near the Mo. P. depot at Lexington. The shaft was down at that date 80 feet, with 35 feet more to go to reach the coal. Size of shaft, 7×14 feet in the clear. A 6×10 air-shaft will be sunk as soon as the main shaft is completed. The air-shaft will be partitioned off into two compartments, one to be used for the air to travel, and a stairway will be built in the other for an avenue of escapement for the men in case of an accident. A pair of engines will be erected, and two boilers will be used to supply steam. The equipment will be first-class in every respect, and the mine ready to ship coal this fall and winter.

NAPOLÉON POSTOFFICE.

Brown & Bomer operate a mine (formerly known as the Silver mine), located 1 mile east of Napoleon, on the line of the L. & K. C. branch of the Mo. P. R. R. Shaft 60 feet deep; steam-power. Mine found to be in good condition; ventilation above the average, same being furnished by a furnace. About 20 men employed. Coal shipped to Kansas City.

Napoleon Coal and Mining Co.—J. H. Duffendock, superintendent. Mine located 1½ miles east of Napoleon, and connected with the Mo. P. R. R. by a switch. Shaft 45 feet deep; horse-power. At date of inspection ventilation was found deficient, not enough air being found moving to turn the air-meter. The superintendent was at once notified, and requested to clean out the air-ways and build a larger furnace that the required amount of air, as demanded by law, be produced within

five days. On the 26th of February the following letter was received from the company:

Mr. CHAS. EVANS, State Mine Inspector:

DEAR SIR—I wish to state that we went to work at once, and in five days had the mine well ventilated. We cleaned out the air-ways and tore out the old furnace, and built a larger one, which remedied the matter at once, and made it satisfactory.

Yours,

J. H. DUFFENDACK.

WELLINGTON POSTOFFICE.

Andrew Carter operates a mine east of Wellington. Drift opening. From two to three men employed. Output consumed by local trade.

C. H. Hartman is operating a mine 2 miles west of Wellington, located on the Mo. Pacific R. R. Shaft 20 feet deep; horse-power. Ventilated by small furnace, which was not producing sufficient amount of air. Thirteen men employed. Coal shipped to Kansas City.

Since our visit, have been informed that the Lexington Coal Company purchased this mine, and now operate it.

J. M. Seawell & Co.—Mine located one and one-half mile west of Wellington, and connected with the Kansas City branch of the Mo. Pacific R'y. Shaft 45 feet deep; horse-power. Ventilation is produced by a small furnace, which is inadequate to furnish the necessary amount of air.

Mr. Seawell was notified to this effect, and requested to remedy the matter at once.

On March 10th, we received the following letter:

KANSAS CITY, Mo., March 10, 1893.

CHARLES EVANS, State Mine Inspector:

We built a new furnace at air-shaft, according to your directions. We think the air good now, but will be glad to have you call at any time convenient.

Respectfully,

J. M. SEAWELL.

At date of inspection, February 16, 30 men were employed. Coal shipped to Kansas City and points west.

Wellington Coal Co.—M. V. L. McClelland, manager. Mine located $\frac{1}{2}$ mile east of depot, at Wellington, and connected by a switch with the Mo. P. railway. Shaft 38 feet deep. Ventilated by a furnace, which was giving good results. As the coal-seam of this mine dips to the south, considerable water is encountered at the face of the workings. About 40 men are employed. Coal shipped to Kansas City.

WAVERLY POSTOFFICE.

A 4-foot vein of coal has been developed at a depth of 110 feet, in two shafts recently sunk. It is of very good quality, and runs quite regular in thickness and level. The roof is a hard shale, requiring very little timbering, and stands well in entries, rooms and air-ways. The pillar-and-room method has been adopted, and coal is blasted off the solid. The mines are generating some gas, but not in dangerous quantities; with a little care, it can be very easily diffused. At our first inspection, February 17, we found only one mine running.

Waverly Coal Co.—F. E. Downs, superintendent. Shaft 101 feet deep; steam-power. Ventilation is produced by a small furnace, with very fair results. The coal is about 3 feet 10 inches in thickness. The price paid for mining unscreened coal is at the rate of 75 cents per ton. About 35 men are employed. Notice was given to the company to have an escapement-shaft put down at once, and the time limited to three months from the 17th day of February, 1893.

On the 1st of March the men struck on account of a proposed reduction in the price of mining from 75 to 60c per ton, and the mine remained closed until the 1st of April, at which time the C. O. Godfrey company, having leased the mine, made a compromise of 62½ per ton.

Our second inspection was made April 27, and found that nothing had been done in the matter of sinking an escapement-shaft, and very little progress made in the mine since our first visit. Inspection on this visit was made at the Francisco mine, and we found it in bad condition. Ventilation was very imperfect and its distribution defective. Inflammable gas had been blocked in the old workings, and as a result the mine was in a very dangerous condition. Instructions were given to the superintendent to open the stoppings and cause the air to circulate around, in order to clear the gas and render it harmless, which was done at once. One of the hoisting ropes was found in bad condition and condemned. Safety-catches were not in proper working order and no gates on the pit-top; in fact, nothing was found as required by law. The company was instructed to have all the necessary improvements made within ten days.

June 17th we again visited this mine and found it idle, full of water, and that nothing had been done in the way of improvements.

LINN COUNTY.

Coal production, 48,302 tons.

This county shows an increase in her coal production for the year just closed of 35 per cent over the year previous. The total production was 48,302 tons this year, as against 35,588 tons for the year preceding, showing the increased tonnage to be 12,714 tons. The average price received at the mines per ton of coal was \$1.57. Six mines were operated during the past season, a description of which, together with a statement of their condition at dates of inspection, will be found as follows :

BROOKFIELD POSTOFFICE.

George Clark—Mine 2 miles east of Brookfield; shaft 140 feet deep; horse-power; coal 24 inches thick, and worked on the long-wall plan; ventilation furnished by a furnace, which was giving very poor results at the date of our visit, March 20; the roof is bad, requiring great care to keep it up. The hoisting apparatus we found to be in such poor condition as to make it dangerous to go up and down upon it. The mine has been in operation 13 years without safety-catches or bonnets on either cage or gates around pit-top. About 18 men worked in the mine last winter, and 12 at date of our inspection. Mr. Clark was requested to secure better and more improved appliances for the protection of his men at once. The output is consumed at Brookfield. Since our visit to this mine, Mr. Clark notifies us that he is opening a new mine at Brookfield, and will abandon the old one this summer.

K. Bottomly is operating a mine south of the Clark mine; shaft 140 feet deep; horse-power. The hoisting apparatus we found in poor condition, there being no catches nor covers on the cages; coal 24 inches thick, and worked on the long-wall plan. From 3 to 5 men are employed. Coal is consumed in the home trade.

Bernard Shaefer—Mine located 3 miles east of Brookfield. Horse-power; shaft 155 feet deep. Mine is ventilated by a furnace, which is doing good work. Coal 26 inches thick and worked on the long-wall plan. About 6 men are employed during the fall and winter, to supply the home demand.

Kansas & Texas Coal Co.—Joseph Hemmings, mine superintendent, Peter McCall, foreman. Mine located at Marceline, and connected by a switch with the Santa Fe R. R. Shaft 187 feet deep, equipped with a steam plant. All machinery was found in good condition, and the safety appliances in good working order. Ventilation is furnished by a 14-foot fan with satisfactory results. The ventilating current is split into four parts, each of which ventilates a separate portion of the

mine, thus furnishing each division with fresh air. We consider this the best ventilated mine in the State. Coal 26 inches thick, and worked on long-wall system.

Some gas is found escaping from the bottom clay, but it is soon rendered harmless by the strong current of air that travels through the mine. Coal consumed by the Santa Fe R. R., and at points west.

R. F. Landreth—Mine located about one-half mile north of Marceline. Horse-power; shaft 130 feet deep; from 3 to 6 men are employed, and output consumed by the local trade.

C. M. Williams operates a mine south of Marceline, over the boundary line in Chariton county; horse-power. Shaft 65 feet deep. A few men are worked during the winter months to supply the home demand.

LIVINGSTON COUNTY.

Production, 1000 tons.

The coal product of this county is the same in amount for this year as for the preceding year, which is produced at the Cox mine, 5 miles north of Chillicothe, the only mine in the county. The coal is from 18 to 20 inches thick, overlaid with soap-stone, with clay mining, and worked on the room-and-pillar method. Operated in fall and winter, to supply home demand.

MACON COUNTY.

Production, 788,563 tons.

Macon county has increased its production of coal 73 per cent in the last two years. The coal mined in the county for the year ending June 30, 1893, amounts to 788,563 tons, and the amount received for same at the mines \$824,478.26. The number of men employed at the mines averaged 1700 during the winter months, and 1402 during the summer season, with an average of 116 mules used in winter and 105 in summer. The average cost of powder was 4 cents per keg less this year than for the year previous, there being 20,993 kegs of powder used, which cost \$37,540.25. The average number of tons of coal mined per keg of powder in this county is shown to be 37 tons.

The number of mines operated the past year was 28, of which 9 are shafts, 3 are slopes, 15 are drifts and 1 strip-pit. At 10 of the mines steam-power is used, and at 4 others horse-power is employed. There are 7 furnaces and 9 fans in use. The average price per ton of coal is

exactly the same as that received during the past year. Although the output for this year exceeds that of the previous year by 103,228 tons, yet this large increase has been made with seven less mines in operation. The principal mines are located at Ardmore, Bevier and Lingo, although there are many smaller mines in the vicinity of College Mound, Macon City and New Cambria, operating in fall and winter to supply local trade. The Wabash and H. & St. J. R's passing through the coal-field furnish good shipping facilities for the coal. Following is a description of all the larger mines, with a statement showing their location and condition as they were found at dates of inspection :

ARDMORE POSTOFFICE.

Kansas & Texas Coal Co.—B. F. Hobart, president, E. J. Crandell, manager, and W. E. Merlin, superintendent. The mines of this company, known as Nos. 26, 27, 33 and 48, together with five others, called Contract mines, are located at Ardmore, which is a mining village situated near the south line of Macon county and 5 miles west of Excello, it having sprung into existence about 5 years ago. The company, after having purchased about all the coal lands in the vicinity of Ardmore, commenced mining on an extensive scale. A switch built to Excello connects the mines with the Ottumwa branch of the Wabash R. R. Since the opening up of the mines in 1888, the output has increased each succeeding year. During the past winter, 500 men and boys were employed, indicating that a population of not less than 2000 persons were dependent on these mines as a means for support. We found the mines all fairly well ventilated, the two largest by fans and the drift mines by furnaces.

As the covering in some of these mines is so shallow in places, rooms cave in and the underground workings are often flooded with surface water.

The coal averages about 4 feet in thickness, and is overlaid with a soap-stone, which is of a friable nature, requiring considerable care and expense for timber. The mines are worked upon the double-entry, pillar-and-room method. Cross-cuts are made in the entries every 60 feet, and cuts are also made in pillars between the rooms to permit the free circulation of air.

The prices paid for mining are 60 cents per ton in winter and 50 cents in summer, run of mine.

The following is a description of the several mines of this company, together with a statement as to their condition as they were found at date of inspection :

J. S. Brock operates one of the contract mines, located 2 miles west of Excello. Mine entered through a drift, and ventilated by a small furnace, which we found in poor condition, and as only a very small fire was kept up, the supply of air was insufficient. Mr. Brock was requested to clean and repair his furnace so as to produce better ventilation. Mine dry and otherwise in very fair condition. About 30 men were employed.

D. E. Davis operates another contract mine, located 1 mile west of the Brock mine and on the west side of East Fork creek. The coal having been exhausted in one of the hills, a drift has been made and entries driven in the hill adjoining, from which point the coal is now mined and hauled to the dump through the old workings of the first hill. Ventilation is produced by a furnace, giving very fair results. The mine generally was found in very good condition. Our second inspection was made May 18, and we found that the spring rains had caused considerable damage by flooding low places. About 40 men were employed.

Still another contract mine is operated by James Duncan. It is located about $\frac{1}{2}$ mile west of the Davis mine. This mine we found in a miserable condition; the road-ways were covered with water a foot deep in places; ventilation was poor; in fact there was no ventilation at all, as the flame of a lamp would not move in what Mr. Duncan called his air-course. The operator's attention was called to the condition of this mine, and requested to have it put in better shape. We were informed that the mine was nearly worked out; the company preferred closing it rather than to expend any more money on it.

Geo. Farris is also operating a contract mine, just east of No. 33. Mine is entered by drift and ventilated by furnace. Mine dry, fairly well ventilated and in good condition. At the date of our inspection, May 18, Mr. Farris was engaged in improving ventilation.

Twenty-five men were employed.

V. Heifner operates a contract mine northwest of No. 26 (formerly operated by S. A. Moss). It is a drift, ventilated by a furnace, and found to be in very fair condition.

Mine No. 26 was worked out and abandoned last spring.

Mine No. 26—Addition is located west of old 26. The mine is entered by a drift and ventilated by a small furnace. We found the condition of the mine good.

Mine No. 27 and other openings in the immediate vicinity of this mine have been worked out and abandoned since the 15th day of March, 1893.

Mine 33—J. P. Sneed, foreman. This is a slope, and coal is brought to the surface by the cable-rope system. This is the only mine in the State at present using this method of hauling, although we are informed that this same company is putting in the cable system at its mine No. 43 at Bevier. This system has proven very satisfactory, and it is undoubtedly the most economical as well as one of the most rapid methods of hauling coal from the pit yet introduced.

This mine has been opened out very extensively and has a large output. The coal runs irregular, and the roof is soft and friable in places, requiring great care in timbering. Ventilation is produced by a 12-foot fan, which was removing 14,000 cubic feet of air per minute at date of our first inspection, and we found the air fairly distributed around the workings.

At our second inspection (May 18), the fan was found to be removing 20,100 cubic feet of air per minute, making 90 revolutions in the same time. Careful examination was made of all parts of the mine, and deficiencies detected in the air-current on the 5th and 6th west entries, due to defective doors, were brought to the attention of Mr. Sneed, who was requested to remedy the matter by putting up air-tight doors to turn the current into the entries named, and also requested that canvas doors be stretched across the roadways in certain portions of the mine, to force the air into rooms to clear the same of poisonous gases which men are forced to breathe, especially in the afternoon, when carbonic oxide gas is generated by the explosion of so much powder.

On our third inspection (June 3), we found that our requests had been fully complied with and the mine to be in good condition.

About 130 men and boys are employed.

Mine No. 48—George Morris foreman. Shaft sunk August 8, 1892; struck coal at 60 feet and started to hoist the same the last of September, with an output in March which reached 600 tons per day. The plan of opening around the shaft bottom at this mine is a very convenient one, and the plan is altogether different from that of any other mine in the State. (See plan of mine following report of this company.)

This mine is equipped with good machinery, consisting of a pair of engines used for hoisting, with 14×24-inch cylinder, connected direct to a 6-foot drum, two boilers supplying the steam-power. The pit-head and tipple-house are well constructed. Shaking screens have been erected to clean and prepare the coal for market. Ventilation is produced by a 12-foot fan, which was moving 21,900 cubic feet of air per

minute, and making 70 revolutions in the same time. Upon inspection, it was found that a very large amount of this air was returning to the up-cast before it had reached the face workings. We found as a cause for this that instead of wooden doors had been substituted, each of which appeared to be leaking. The air was found deficient in the first and second south entries, the first and second northwest entries. The attention of the superintendent, and also Mr. Morris, foreman, was called to the deficiencies mentioned, and request made that the same be remedied at once, by putting in good, air-tight wooden doors wherever a door was needed.

This inspection was made May 19, and on the 30th of May while inspecting the mines of the same company at Bevier, we obtained information from the miners of No. 48 that no effort had been made to better the ventilation in the aforesaid entries, and that the miners were suffering for the want of air. We wrote Mr. Merlin at Bevier, informed him that we would visit the mines in a few days, and requested him to find our instructions complied with.

On June 3 we made another inspection of this mine, and found one wooden door had been put up to replace the canvas door in the south entry, and that they had started work on another door in the first and second northwest entries. The canvas door in the first and second southwest entries were still hanging and leaking away. We notified Mr. Crandall of this, and we are pleased that the matter was attended to at once.

We find that the mines of the Kansas and Texas Coal Company are located in nearly every section of the State where good coal can be obtained, and as well equipped as money and skill can make them. The machinery, including ropes, cages and safety appliances, are of the very best, and always kept in good repair. The ventilating system is of the latest and most approved pattern and fully equal to the best made by law in furnishing the required amount of air. The mine workings are practical, and the double-entry system adopted with a view to proper ventilation is perfect. We have the impression, arrived at by our intercourse with the general manager, Mr. E. J. Crandall, that this company desires to fully comply with the mining laws of the State, and employ all the means necessary to secure safety and comfort to its miners.

Considerable water was encountered in this mine, and the roadways are very wet and muddy, but its foreman, Mr. Morris, who had only been in charge a few weeks, was making great improvements, and

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ctions made respectively in the months of March and May :
s and Texas Coal Co.—Wm. Egly, superintendent. This
perates two mines at this place. Mine No. 43 is located 1½
west of Bevier. Steam plant and equipped with good ma-
The pit-head and top buildings are well constructed for
se and economy. A shaking screen has been erected here
connecting apparatus necessary to screen, clean and pre-
al for market. The shaft is 140 feet deep, ventilated by a
making 85 revolutions per minute, and removing 21,930

cubic feet of air in the same length of time. However, after a careful examination it was discovered that not one-tenth of that amount of air was being forced around the mine, but the same was being wasted through defective doors and stoppings, returning to the up-cast without having reached the face of the workings. Doors were found open in different parts of the mine, and the comfort of the miner badly neglected. We notified Mr. Crandall, by letter, of the deficiency in air, who very promptly responded that he was sorry to learn of such a condition of affairs, and stated that it was the intention of the company, as well as himself, to keep the mines at all times in the best possible shape, and fully comply with the law. He further stated that he would attend to the matter at once.

Our first inspection was made March 15th, and on the 4th of April we made another inspection and found a great improvement in the ventilation of this mine. New doors had been put up, defective ones had been repaired, air-ways had been cleaned, stoppings made air-tight and a good current of fresh air was found traveling around the workings. We also met Mr. Crandall on the ground, giving his personal attention to these improvements.

Our third inspection of this mine was made June 2d, and it was found in good condition.

About 144 men and boys, and 15 mules are employed here. Coal shipped to St. Joe and northwest points.

Mine No. 46 is located 2 miles southeast of Bevier; it is a new mine, operated a little over a year, with equipment consisting of the latest improved machinery. The top-buildings are modern in their construction; a shaking screen has been built with all the necessary appliances to clean the coal and to separate it into cars of lump, nut, pea and slack. Shaft 172 feet deep, ventilated by a 12-foot fan making 80 revolutions per minute, and passing 23,330 cubic feet of air in the same length of time. The air is split at shaft-bottom, the currents being directed east and west to face of entries; here it is again split and directed to the north and south entries—its return being made from the north side to the up-cast, over an air-crossing. Measurement of the air was taken on both sides of the shaft, and found above the average.

The mine was originally intended to be worked by machines, but owing to the large amount of low coal, that method was abandoned, and it is now worked in the old way.

This shaft was sunk near the east edge of the coal-belt, but here the coal is found faulty and the roof very bad—in fact, more so than

at any of the other mines in this vicinity. The road-ways are high, dry and in good condition. About 130 men and boys are employed. Coal is shipped to St. Joseph and points west and northwest.

Loomis Coal Co.—W. H. Loomis, general manager; Thomas Francis, superintendent. This company operates two mines at this place, and it is opening up still another mine further south, all of which are or will be connected with the H. & St. J. R. R.

Mine No. 1 is located near the depot; it is the oldest mine in the State now in operation, having been opened in the year 1861, and operated continuously since that date. Shaft is 60 feet deep, and equipped with steam-power. The machinery is old and well worn, as are also the pit-head and top buildings, which are rickety and in need of repairs. Ventilation is furnished by a 10-foot fan, and is very good, considering the long distance the air is compelled to travel. Our first inspection was made March 16, at which time 13,220 cubic feet of air was passing per minute. At our second inspection, made on May 1, the required amount of air was found passing. Considerable water is encountered on the south side coming from the old working, but on the north side the road-ways are dry and in good condition. About 60 men are employed. Coal is shipped to the west and northwest.

Mines Nos. 2 and 3, in the spring of 1892, were filled with water from swollen creek, and have been abandoned since that time.

Mine No. 4 is located at Bevier; shaft 60 feet deep; steam-power. Work here is carried on extensively. The north part of the mine is driven in nearly a mile from the shaft-bottom; ventilation is produced by a 12-foot fan, making 100 revolutions per minute, but expending considerable power with very small results, owing to the contracted air-ways and the long distance the air has to travel, also to the frictional resistance brought about by the many bends and angles encountered.

The current of air was found deficient in quantity, as well as vitiated by black damp, thus rendering it unfit for the men to breathe. The habit of forcing air with fans has been practiced at this mine for a number of years, and, as a consequence, the air has to first travel through the old workings, where the decay of material is constantly going on, and this air, coming in contact with the organic matter thus thrown off, renders it positively poisonous before it reaches the miners.

We cannot too strongly condemn such method, as we consider it altogether impracticable. The miner should have the air delivered to him in the most direct way from the down-cast, and plenty of it. We feel it our duty to do all in our power while clothed with the authority to improve the sanitary conditions of the mines of this State. The

air in this mine is caused to circulate around in one undivided current for a distance of 8000 feet, which system is as old as the coal itself. We are sorry to meet men in charge of important works, some of whom have spent most of their existence in mines, yet indifferent to the much-improved modern methods employed in mine ventilation.

Careful examination was made of all parts of the underground workings, and the air-ways were found nearly closed in places, making it difficult for a body of air to pass through. We requested the superintendent to reverse the air, clean up the air-ways and make such necessary changes as would furnish pure air to the miners; which request we hope to find complied with on our next visit. This mine was formerly worked by machines, but they were taken out last January, and the mining is now done by hand. There are about 140 men and boys, together with 26 mules, employed at this mine. The coal is shipped over the Hannibal & St. Joe R. R. to St. Joseph; also points west.

Black Diamond Coal Co.—W. S. Watson, superintendent, L. Bradford, foreman. Mine located $1\frac{1}{2}$ mile southwest of Bevier. This is comparatively a new mine, but it is very extensively opened out and has room for quite a number of men. The shaft is 60 feet deep and equipped with good machinery for hoisting, draining and ventilating.

Our first inspection was made March 16, at which time we found the mine well ventilated. A 12-foot fan is set on top of the air-shaft, which was making 75 revolutions and removing 26,260 cubic feet of air per minute, and the air seemed well conducted around the workings. On our second inspection, which was made June 1, we found the mine still well ventilated and in very fair condition. Considerable water was encountered in this mine, but it is well taken care of and thrown out by a powerful Knowles pump. The road-ways were found in better condition on this visit, and every effort appeared to be made to keep them dry. About 125 men and boys are employed. The coal is shipped over the Hannibal & St. Joe R. R. to points west.

Watson Coal Co.—W. S. Watson, superintendent; Wm. Rivers, foreman. Mine located at Bevier; shaft 70 feet deep; steam-power; ventilated by a 10-foot fan. Two inspections were made of this mine—the first on March 17 and the second on June 2. We found the mine nearly worked out; the men were engaged drawing pillars, and it was plain that the mine would be abandoned in a few months. The condition of the mine, as well as the ventilation thereof, was found very good at both inspections. The company is now sinking another shaft just south of the old one, and it is said that it will be ready for operation by the time the winter trade sets in.

LINGO POSTOFFICE.

Little Pittsburg Coal Co.—A. G. French, superintendent ; H. Howe, foreman. Mine located at Lingo, a mining camp 5 miles east of Bucklin, on the line of the Hannibal & St. Joe railroad. Shaft 135 feet deep, steam-power. Mine is worked on the long-wall plan, but the roof is not very well adapted for that plan of mining, great care and expense being necessary to keep it properly secured. The coal is $3\frac{1}{2}$ feet thick, with a band of rock near the bottom 5 inches thick, which is quite a drawback to the economical working of the coal.

Ventilation is produced by a 12-foot fan, which was removing 8530 cubic feet of air per minute. The air travels the main north to the face entry, here to split into two currents, one of which is directed to the east and the other to the west ; thence back and around the face of the workings to the up-cast, the return air from the east side passing over an air-crossing. The mine is dry and very hot, the heat being caused from spontaneous combustion in the refuse of the mine. Cages and safety-catches in poor condition. About 75 men are employed.

NEW CAMBRIA POSTOFFICE.

The mining done at New Cambria is on a small scale. The following are the names of the operators :

Wm. Havard, Joseph Yates and Thomas Gunter each operates a strip-pit.

Coal is about 20 inches thick and of very fine quality, all of which is consumed by local trade.

MACON CITY POSTOFFICE.

Considerable mining has been done in and around the vicinity of Macon City, but only in a small way to supply the local trade.

Most of the mines are located along the bank of the East Fork creek, having drift openings. The coal is the same as that mined at Ardmore and Bevier, and is operated in the same manner.

The following are the names of a few of the parties that are mining in the neighborhood of Macon :

W. J. Blansett, Robert Terrell, John Harold, Peter F. Rowland, E. Zollmann, George F. Smith, Charles Lawrence, Thomas P. Hunt, and others.

The capacity and output of most of these mines is very small.

MONTGOMERY COUNTY.

Production, 15,923 tons.

WELLSVILLE POSTOFFICE.

The Vandalia Coal Co. is operating a mine at Wellsville, which is the only mine in the county now in operation. The shaft is 100 feet deep, the product being hoisted with steam-power. The mine is ventilated by an 8-foot fan, which was giving good results. The coal is about 30 inches in thickness and is worked on the long-wall plan. The coal runs irregular and faulty, which adds quite an expense to the price of mining. The roof is good, requiring very little timbering. The mine is dry, with good, high road-ways and in good condition. It gives employment to 40 men and boys. Coal consumed by the Wabash Railroad Company, which is taken by the engines from the coal chutes that have been erected at the mine. A. Delolder, superintendent.

NODAWAY COUNTY.

Production, 2548 tons.

The mining done in this county is prosecuted in the surroundings of Quitman, at local mines, to supply home demand. Several small mines are in operation here, worked by shafts and slopes.

Following is a description of some of the mines:

Birch mine is operated by Corydon Bird. Shaft 50 feet deep, hoisting by horse. This shaft was sunk last fall, and an opening was made to the old shaft for escape and ventilation. Coal is 14 inches thick, and worked on the long-wall plan; employing 8 men in winter, to supply home trade.

T. H. Howard is operating a mine near Quitman. Shaft 33 feet deep, hoisting by horse-power. Coal 16 inches thick; worked on room-and-pillar plan. Eight men are employed in winter to supply local trade.

Henry Howard is operating a slope. Coal 18 inches thick, worked on room-and-pillar plan; employing 6 men, to supply local demand.

Thos. Martin operates a slope, and employs a few men in winter to supply home demand.

John Manorgan—Slope opening; coal 12 inches thick; worked on room-and-pillar method; employing 5 men in winter. Coal consumed at Quitman.

Nicholas mine—Shaft 32 feet deep; coal a foot thick. Employ 4 men to supply local trade.

F. F. Phillips—Slope opening; coal 12 inches thick; worked on pillar-and-room plan. Coal consumed at Quitman.

O. C. Pierson mine—Slope opening; coal 14 inches thick; room-and-pillar method used. Employing a few men in winter to supply local trade.

PUTNAM COUNTY.

Production, 145,461 tons.

Putnam county, for the year just closed, proves to have made a large increase over the year preceding in its production of coal. This year's output reaches a total of 145,461 tons as against 134,984 tons the previous year, a gain of 10,477 tons. The average price per ton of coal received at the mine was \$1.36, and the total amount received for the product \$198,357.43. In its coal production, 382 men were employed during the winter and 293 men during the summer. Twelve mines were operated, a description of which, and the condition in which they were found at dates of inspection, is as follows:

BLACKBIRD POSTOFFICE.

Wm. Adkins operates a mine north of Blackbird creek. Shaft 37 feet deep, horse-power; worked on the room-and-pillar plan. About four men are employed.

Blackbird Coal Company—O. W. Lane, president, Wm. Love, superintendent. Mine located at Blackbird, three miles north of Unionville, and connected by a switch with the C. B. & K. C. R. R.

Shaft 53 feet deep; steam-power employed for hoisting and draining. Coal 33 inches thick, worked on the room-and-pillar plan. Mine was being ventilated by a furnace which we found inadequate to meet the demands of a mine of its size.

Mr. Love informed us that it was the intention of the company to erect a fan in the near future. We found the mine making considerable water, and roadways wet in many places.

About 40 men were employed.

The output is shipped to points west and northwest. About the 1st of May, the plant at this mine was burned, causing great loss to the company, since which time, however, the same has been rebuilt and the mine is again being operated.

Wm. Jump operates a small mine at Blackbird. Shaft 27 feet deep, horse-power, worked on the room-and-pillar plan.

Mendota Coal Co.—F. B. Ketcham, president, and B. H. Johnson, superintendent. Mendota is a mining village, situated in the northern

part of Putnam county, near the Iowa line. This camp was first settled in the year 1880, at which time the Ketcham Bros. bought a large tract of land here and opened some mines. The company own at this place 250 dwelling-houses, one church, school-house, bank, large supply store and a butcher shop. About 300 miners are employed in winter and 200 in summer. Coal averages about 33 inches in thickness, and is worked on the pillar-and-room plan. The coal crops out in the hillsides, and two of the mines are entered by a drift. Mining is done by pick-work, no powder being used.

The following is a brief description of each mine operated by the company as we found them at date of inspection:

Mine No. 1—E. C. Smith, foreman. Has drift opening and is worked very extensively, machinery being used to bring out the coal by the tail-rope system. Mine is ventilated by two furnaces, one located on the north and the other on the south side of the east entry. Upon a careful examination made March 22, the mine was found to be fairly well ventilated. Headers are driven ahead of entries, to shorten the distance the air would otherwise have to travel, with the further good effect of lessening the frictional resistance, and the air in consequence reaches the miner much fresher. Some little deficiency of air was found in the 11th north entry, and upon Mr. Johnson's attention being called to it he stated that the company intended to sink another shaft, which would furnish a sufficient amount of air for that part of the mine. Eight Harrison coal-cutting machines are in use.

Mining is done by piece-work; mines dry and in fair condition. The coal is shipped to points west and northwest.

Mine No. 2—D. Coleman, foreman. This mine is located about 2 miles southeast of Mendota. The shaft, which is 65 feet deep, was sunk last winter, and the driving of entries commenced in January, 1893. The hoisting is at present done by horse-power, but it is claimed that the mine will be equipped with good machinery by the time the winter trade commences. An escapement-shaft has already been sunk, and a ventilating fan will soon be erected, and new houses have been built for the comfort and convenience of miners. The work up to date, March 21, has been confined entirely to entry-driving, and will so continue until the fall run sets in, at which time it is expected that 150 men will be put in the mine. The coal is 33 inches thick, overlaid with an excellent roof, and the indications all point to an active and prosperous mine.

Mine No. 4—B. Novinger, foreman. Mine located 1 mile north of the depot. It is a drift opening, with a connecting track elevated sufficiently above railroad track to permit of dumping. The coal is brought

to the surface by machinery, and the ventilation is produced by a furnace, which, at the time of our inspection, was giving good results. The same system is in use here for conducting the air-currents as that which prevails at Mine No. 1. About the only complaint that has been received concerning this mine is of neglect in attending to the furnace. The thickness of the coal and manner of working the same is similar to that at Mine No. 2. Mine dry, road-ways high, and both in good condition. Coal shipped to points west and north.

John Leck operates a drift mine 1 mile north of Mendota to supply the home trade.

UNIONVILLE POSTOFFICE.

There are several mines located southeast of Unionville, which are operated during the winter season to supply local demand.

The following is a list of parties operating at this place :

Carter Bros., Minear Bros., Dickson Bros. and Frank Hinkle. Time would not permit us to visit all the small mines in this section.

RALLS COUNTY.

Production, 2160 tons.

PERRY POSTOFFICE.

Coal has been found in various parts of Ralls county, but as yet very little mining is done.

The Vandalia Coal Co. operates a mine at Perry, on the line of the Hannibal & St. Louis railroad. A shaft was sunk last winter, and a 2-foot seam of coal was developed at a depth of 40 feet. At present the hoisting is done by horse-power, but it is claimed that machinery will be erected for that purpose. Six new houses have been built.

The mine is worked on the long-wall plan, and although the roof is of black slate and appears rather soft for this system of mining, yet it seems to stand better under the long-wall system than that of the pillar-and-room plan. Ventilation was being produced by a furnace.

The coal is of a very fine quality and finds a ready market. It is underlaid with a soft clay and easily mined. Mine dry, and about 16 men are employed. Coal shipped to Hannibal.

Cohé & Yancey are opening a mine near Perry, on Lick creek. Coal 2 feet thick, with a very good roof. Several strip-pits are found around Perry, working during the winter to supply the local trade.

RANDOLPH COUNTY.

Production, 219,762 tons.

Randolph county for year ending June 30, 1893, falls short in her output of coal 77,249 tons, as compared with the year previous. This is due to the suspension of work by the Inter-State Coal and Mining Co., which is not only the best equipped mine in the State, but was its largest producer. Suspension of work at this mine was brought about by a disagreement between its operators and the railroad companies.

The output of this mine for the previous year was 117,638 tons, and had the mine continued operations during this year, Randolph county would have shown a handsome increase.

The county produced this year 219,762 tons, which was sold at the mine at an average of \$1.1181 per ton, or a total valuation of \$245,720.61.

The mines employed on an average 686 men in winter and 430 in summer, and 27 mules during the winter and 24 during the summer.

There were 3232 kegs of powder (costing \$6591.50) used in the mining of coal this year.

There are 27 mines now in operation in this county, of which 11 are shafts, 7 are slopes and 9 are drifts. There are 6 mines employing steam-power, and 10 using horse-power. There are 13 furnaces and 5 fans used for ventilation.

The system upon which the mines of this county are operated is confined almost exclusively to the pillar-and-room plan, for out of a total of 27 mines only 2 are worked upon the long-wall method. The largest mines are located at Elliott, Higbee and Huntsville. However, a large amount of coal is mined in the vicinity of Moberly to supply the home demand.

The Chicago & Alton, Missouri, Kansas & Texas and Wabash railroads passing through the center of the coal-field afford good shipping facilities for the product.

Following is a description of the principal mines:

ELLIOTT POSTOFFICE.

Fleming Coal Company—Mine located at Elliott, on the line of the M., K. & T. R. R., 5 miles south of Moberly. Shaft 145 feet deep, equipped with machinery for hoisting.

This mine was closed down for about two years, and was reopened in December, 1892. The old engine was taken out and a new one set in its place. A new engine-house was built, and other necessary im-

provements made. The mine suffered considerable damage during the time it was idle, but was repaired, and in very fair condition at date of inspection, March 27th. Ventilation was up to the requirements of the law. Coal 3 feet 8 inches, and worked on the long-wall plan. Mining is paid for at the rate of 80c per ton, for clean coal. About 100 men are employed. Coal consumed by the railroad company. All the safety appliances, as well as the mine, was found in good condition.

Harrison Jones, superintendent.

HIGBEE POSTOFFICE.

Higbee Coal & Mining Company—Wm. Walters, superintendent, Thos. Bain, foreman. Mine located west of Higbee, on the line of the Chicago & Alton R. R. Shaft 170 feet deep, equipped with good machinery for hoisting.

Considerable improvements have been made at this mine during the past year. A new engine and boiler-houses have been built, and the boiler-walls remodeled. A box-car loader was put in, but the engine was too small to do the work, and it was sent back for a larger one. The shaft bottom has been retimbered, the air-ways cleaned, and an over-cast erected. Ventilation is furnished by a 10-foot fan, making 75 revolutions per minute, passing 14,000 cubic feet of air in same time, and which was well conducted around the face of the workings. The air-current is divided into four splits, and each split ventilates a separate division of the mine. It is forced to the east and west entries, carried to the west side, over air crossings, and unite at face of north and south entries, over which entries it makes its return to the up-cast.

The coal is about $3\frac{1}{2}$ feet thick, and worked on the long-wall plan. Eighty cents per ton is being paid for clean coal. The mine is dry, with good, high road-ways, and in good condition. The coal is almost entirely consumed by the U. & A. R. R. Co. Ten chutes have been erected, and all the trains stop to take coal at the mine. Following this will be found a correct map of this mine.

Interstate Coal Co.—J. S. Elliott, president; Wm. Walters, superintendent. This mine is located $1\frac{1}{2}$ mile south of Higbee, and connected with the M., K. & T. R. R. This is one of the best equipped mines in the State, but unfortunately has been idle through the year, owing to the company losing their contract to supply the M., K. & T. R. R. Co. with coal. The mine is practically dry, and easily kept in repair, which is done. It had a capacity of 600 tons per day when stopped, which amount could be put out again on short notice. The machinery and all the safety appliances are of the very best, and in good order. The mine has been opened up in a practical way, and was

well managed. It is unfortunate that such an excellent mine remain idle. Since writing the above we are informed that it has been cleaned up and is again being operated.

HUNTSVILLE POSTOFFICE.

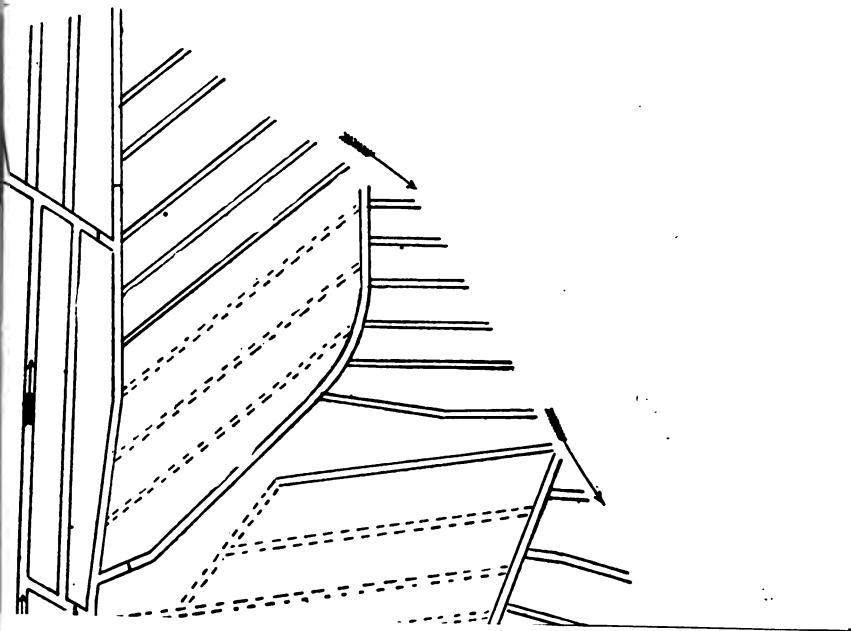
Mine No. 1½—John Breckenridge, owner and manager located 2 miles east of Huntsville, and connected with the Wabash R. Shaft 100 feet deep; equipped with steam-power for 100 horse-power. Mine ventilated by a fan, giving very fair results. Two inspections have been made of this mine during the year. First inspection made March 7, when the fan was found to be removing the required quantity of air around the workings, and the mine found in good condition. Second inspection was made May 16, when the ventilation found deficient in third southwest entry; but improvements were being made which would remedy the deficiency. The coal is thick; worked on the double-entry room-and-pillar plan. From 80 men employed. Coal is transported over the Wabash R. consumed at Kansas City and points west. J. Paterson, foreman.

Mine No. 3 is located at Huntsville, and was operated throughout the winter by the Cafery & Baker company, but closed down the March. In April, a company of miners started to operate the mine but failed to get the air in circulation and closed the mine again; it is now idle.

Mine No. 3½—John Breckenridge, owner and manager. Located at Huntsville; connected with the Wabash R. R. Shaft 80 feet deep, hoisting by steam-power. Ventilation is furnished by a foot fan, making 65 revolutions per minute, removing 13,700 cubic feet of air in same time.

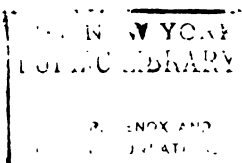
Two inspections have been made of this mine during the year. First inspection was made March 6, and the mine was found well ventilated. A new air-shaft was sunk during the winter 1700 feet from the hoisting shaft, and was used as a down-cast.

The air at the foot of the shaft was split; part of it was sent north to ventilate the two entries on that side of the air shaft, and the largest volume was conducted south to ventilate the east and west entries. Second inspection was made May 17, and deficiency in ventilation was discovered in the third west entry; the air was not circulating in the third east entry, but preparations were made to erect an over-cast on the south entry to carry the air from the west to the east side, which would do away with the doors on the south entry and improve the current.



room plan. About 15 men are employed here in the winter. Coal
mined in wagons and shipped over the Wabash R. R., and consumed
locally.

Mike Strieff—Drift opening. Located at Huntsville on north side.
Coal 4 feet thick; worked on room-and-pillar plan. Supplying home
market.



in the third east entry, but preparations were made to erect an ov
cast on the south entry to carry the air from the west to the east si
which would do away with the doors on the south entry and impro
the current.

Coal 4 feet thick, worked on the room-and-pillar system. Mine dry and roadways in good condition.

Employing 80 men.

Coal carried to market over the Wabash R. R., and consumed at points west. I. Jacks, foreman.

Caffery & Baker Coal Co.—Mike McHugh, superintendent; Geo. Evans, foreman. This is a new mine, opened out last winter, and situated 1 mile west of Huntsville. A switch has been constructed from the main track of the Wabash R. R. and coal is hauled by a switch engine. The mine is a drift opening and worked on the double-entry room-and-pillar plan, and ventilated by a furnace, which was giving good results. Coal 4 feet thick, overlaid with excellent roof.

From 80 to 100 men and boys are employed.

Coal carried to market over the Wabash R. R., and consumed at Kansas City and points west and northwest.

The company is opening out other mines in this vicinity.

J. S. Burke is operating a mine north of Huntsville. Drift opening; coal 4 feet thick; worked in winter to supply local trade.

Emanuel Edward operates a drift mine north of Huntsville to supply home demand. Coal 4 feet thick; room-and-pillar plan.

John Lowes (now deceased) operated a mine last winter at Huntsville. Coal 4 feet thick, worked on room-and-pillar plan, supplying local trade and also shipping over the Wabash R. R.

Lamb & Bailey—Drift opening. Mine located at Huntsville. Coal 4 feet thick; worked on room-and-pillar plan. Ventilation is produced by a furnace, which was passing a very fair current for the capacity of the mine. Coal hauled in wagons and shipped over the Wabash R. R. From 4 to 8 men employed.

W. E. Mitchel operated a mine in the first part of last winter, north of Huntsville. Coal ran out and mine abandoned.

Robinson & Stewart—Drift opening. Mine located on the west side of Huntsville. Ventilation furnished by a fan. Coal 4 feet thick; room-and-pillar method used. From 5 to 10 men employed. Coal hauled and shipped over the Wabash R. R.

Rutherford & Son—Drift opening. Mine located west of Huntsville. Mine is ventilated by a furnace, and worked on the room-and-pillar plan. About 15 men are employed here in the winter. Coal hauled in wagons and shipped over the Wabash R. R., and consumed west.

Mike Strieff—Drift opening. Located at Huntsville on north side. Coal 4 feet thick; worked on room-and-pillar plan. Supplying home trade.

MOBERLY POSTOFFICE.

Moberly Mutual Coal Co.—P. I. Perkins, manager. Mine located 2 miles northwest of Moberly. Shaft 105 feet deep; hoisting by horse-power. Mine ventilated by furnace, which was giving very fair results. Coal 4 feet thick; worked on the room-and-pillar plan. From 8 to 15 men employed. The coal is consumed in the vicinity of Moberly.

Henry Ward—Mine located 2 miles northwest of Moberly. Shaft 85 feet deep; horse-power; ventilated by a furnace; worked on room-and-pillar plan, employing 6 men to supply home trade.

J. B. Williams—Mine located 1½ mile north of Moberly. Shaft 96 feet deep. Operated in winter to supply local demand.

Following is a list of parties operating mines on a small scale in the immediate surroundings of Moberly:

Jacob Hoover, drift opening; 3 miles north.

William Brennan, drift opening; mine abandoned last winter.

W. K. Roebuck, drift opening; mine located 3½ miles northwest.

W. E. Miller, drift opening; mine located northwest.

John Schnider, drift opening; located northwest.

Wm. Vaughn—Mine located 4 miles west; drift opening.

Young & Co., drift opening; located northwest.

All of the above mines are working on the room and-pillar plan, and on the same seam of coal as that worked in other parts of the county. The coal is hauled in wagons, and consumed at Moberly.

Eagle Coal Co.—H. R. Bisbee, superintendent. This is a new company; it has leased several hundred acres of coal land adjoining the city limits on the west side.

A trial shaft was put down first and a 4-foot vein of coal was struck, on July 7, at a depth of 124 feet. Preparations were then made to put down a shaft, which will be equipped with good machinery and made ready for the winter's trade.

RENICK POSTOFFICE.

Renick Coal Co.—E. L. Hubbard, superintendent. Mine located at Renick. Shaft 85 feet deep. Equipped with very good machinery for hoisting. All safety appliances in good repair. Mine ventilated by a steam-jet on date of inspection, but preparations were being made to erect a furnace. Ventilation was deficient, there not being half the amount of air as required by law. The company was requested to remedy the deficiency at once, and to sink an escapement-shaft, as required by section 7063 R. S. Coal 3½ feet thick; worked on the

room-and-pillar plan. About 20 men employed. Coal shipped over the Wabash R. R., and consumed at local points along the line of railroad.

There are three other local mines in this neighborhood, operated by the following parties in winter to supply local trade: Jack Brown, drift opening; Jack Morris, drift opening, and Ed. Ward. The product from the above is consumed in the vicinity.

There are several other small mines in this county, located at Jacksonville, Rolling Home and Thomas Hill, which we have not had the time to visit as yet, but the product of the mines will be found in the statistics at table of this county. The mines are operated only in winter, and the product is consumed in their immediate vicinities.

RAY COUNTY.

Production, 319,405 tons.

Ray county makes an increase in her output of coal over the previous year of 17 per cent. This increase would appear larger did some of the operators appreciate the necessity of reporting correctly the product of their respective mines. We are convinced that certain operators not only violate the law but do the county an injustice, in so far as she is entitled to full credit for the product of her mines, by the careless manner in which they make up their annual reports. This department cannot and will not submit to like carelessness in the future.

The total output of coal for the year amounts to 319,405 tons, as against 272,948 tons for the year preceding. The average price per ton of coal received at the mine was \$1.52.

The number of men employed in the mines averaged 1083 during the winter months, and 607 during the summer season. The number of mules worked in the mines average 30 in the winter and 23 in the summer.

Of the 25 mines operated this year, all are worked on the long-wall plan. There are 20 shafts, 2 slopes and 3 drifts, with steam-power employed at 11 mines, and horse-power at 9 mines. There are 16 furnaces and 2 fans used in the ventilation of mines.

A very important feature connected with mining may be observed in this county, and that is the absence of any record whatever of the use of powder. The importance we attach to this is not only the economical advantage of mining without the use of powder, but the great number of lives and limbs saved by its non-use; in proof of which it

may be seen by reference to tables on accidents, that while the county stands fourth in amount of coal produced, not a fatal accident has occurred in the past two years.

This county, for the year ending June 30, 1892, ranked fifth in amount of coal produced, but this year she takes a step to the front and ranks fourth.

Her principal mines are located at Camden, Fleming, Orrick, Richmond and Swanwick, while smaller mines are operated in other sections to supply the local trade. The coal is shipped to market over the St. Joe branch of the Santa Fe, and also over the Wabash R. R., which roads pass through the coal-field, furnishing good shipping facilities.

Following is a description of the principal mines:

CAMDEN POSTOFFICE.

Bovard-Brown Coal Co.—B. Lusk, manager, George W. Thomas, foreman. Mine located 2 miles west of Camden, and connected by a switch with the Santa Fe R. R. Steam-power is used for hoisting and draining the mine. Ventilation is produced by a furnace with satisfactory results. About 50 men are employed during the winter. Coal shipped to Kansas City.

The Cravens Coal Co.—Wm. Hensley, foreman. Mines located one and one-half mile east of Camden. Shaft 30 feet deep; steam-power. The mine was closed in December, 1892, owing to bad roof and water.

FLEMING POSTOFFICE.

Kansas & Texas Coal Co.—B. F. Hobard, president, Edward Vail, superintendent. Mine located at Fleming, and connected by a switch with the Wabash R. R. Shaft 75 feet deep and equipped with good machinery for hoisting. Ventilation furnished by a 12-foot fan, which was removing a very large volume of air, and the same was being well conducted around the workings. The air enters through the hoisting-shaft, and travels the north entry to face of workings; here it is split into two currents, one of which is directed to the east, and return being made along face of the workings to the up-cast. Ventilation was here found to be above the amount required by law. The mine is dry and in good condition, with high roadways.

Considerable improvement has been made at this mine of late. The pit-head has been repaired, a new tip-house built, two new cages were being put in, having the latest improved safety-catches. New guides had been put in place suitable to the cages, and all the safety appliances we found had been overhauled and put in thorough repair.

Employment is furnished to about 100 men in winter, and 60 in summer.

Coal is shipped to points west, but the Wabash R. R. consumes a very large amount of the output.

There are 10 chutes erected at the mine with which to coal trains. About 60 tons per day are consumed in this way.

GEORGEVILLE POSTOFFICE.

W. Sater operates a mine at Georgeville. Shaft 155 feet deep; horse-power; about five men employed in winter to supply the home demand. Coal about 22 inches thick, and worked on the long-wall plan.

HARDIN POSTOFFICE.

There are no mines in the immediate vicinity of Hardin, but several parties are operating on a small scale a few miles north, supplying the local trade.

The coal is about the same as that worked at Richmond, but not quite so thick. The mines are all, however, worked on the long-wall plan.

Fred. Bucklinger operates a small drift mine.

Hartwell, Arnold & Co. operate a drift mine five miles north of Hardin.

Joseph Huston operates a drift-mine five miles north of Hardin.

Wm. Phillips operates a mine three miles north of Hardin.

Wm. Sickles is operating a drift mine five miles north of Hardin. There are also several others operating mines during winter to supply the local trade.

ORRICK POSTOFFICE.

Bissell Coal Co.—John Bissell, superintendent. Mine located at Albany, one mile north of Orrick. The coal is hauled one mile over a tramway and loaded on cars at Orrick, at which point it is shipped over the Wabash railroad. Shaft 63 feet deep, equipped with very good machinery. Ventilation was very poor at date of inspection, April 11, and notice was given to Mr. Bissell to at once begin the sinking of an escapement-shaft, and to so improve the ventilation of the mine as to meet the requirements of the law in the matter. Coal about 20 inches thick and worked long-wall. Mine very wet and in poor condition. About 30 men employed.

RICHMOND POSTOFFICE.

Black Diamond Coal Co.—Wm. Pence, superintendent. Mine located at Richmond. Shaft 80 feet deep; horse-power. A new

shaft was sunk last fall from which the coal is now being worked, the old shaft having been abandoned. About 12 men are employed in the winter to supply the local demand for coal.

Mandry Chew (colored)—Mine located north of Richmond; shaft 95 feet deep; horse-power. Coal consumed in the neighborhood of Richmond.

Darneal Coal Co.—John Hubbell, manager; John W. McCart, superintendent. Mine located one mile west of Richmond; shaft 110 feet deep; horse-power. On visiting this mine we found it closed down for the summer, and no inspection was made.

W. Douglas operates a mine on the east side of Richmond; shaft 60 feet deep; horse-power; running in the winter to supply local demand.

Hubbell Mining Co.—John Hubbell, manager; John W. McCart, superintendent. Mine located west of Richmond and connected with the St. Joe branch of the Santa Fe railroad; shaft 110 feet deep; steam plant; ventilation is produced by a furnace, but as the mine was not running at the date of our visit, April 8, no inspection could be made.

Hubbell, Hyat & Hubbell Coal Co.—John Hubbell, manager; John McCart, superintendent. This mine is located within the city limits of Richmond; shaft 115 feet deep; steam-power, and ventilated by a furnace located near the bottom of hoisting-shaft, exhausting through an air-chamber partitioned off from the side of main shaft. We made a careful examination of this mine April 8, but as the mine was not running on that day and but very little fire in the furnace, no test of the air was made. A road-way is kept open between this mine and that of the Hubbell Mining Co. for the purpose of escape in case of fire or accident in either of the mines. Machinery, gates, gauges, safety-catches and ropes in good condition. Mine dry and also in very fair condition.

Murray & James—Mine located two miles southeast of Richmond; shaft 60 feet deep; horse-power. A few men are employed in the winter to supply the local demand for coal.

Joseph Pickering Coal Co.—Mine located one mile west of Richmond, connected with the St. Joe branch of the Santa Fe railroad. Shaft 110 feet deep, equipped with good hoisting machinery; ventilation is produced by a furnace located near the hoisting-shaft, exhausting through a chamber partitioned off the side of the main shaft. A road-way is kept open between this shaft and the Darneal Coal Co.'s mine for escapement. Ventilation was very fair and mine in good condition.

W. D. Rankin & Co.—W. D. Rankin, manager. This mine is located about one mile west of Lexington Junction, and is connected with the St. Joe branch of the Santa Fe railroad. It is a drift mine, ventilated by a furnace. At date of our inspection, April 10, work was being done only on one side; the other side had been stopped owing to bad air. Mine is worked on the long-wall plan, and the coal shipped to St. Joe and points west and northwest.

Richmond Coal Co.—J. S. Hughes, president; John Gibson, superintendent. This company owns and is operating six mines in this county, from which a large amount of coal is produced each year and furnishing employment to a large number of men. They are all worked on the long-wall plan, well ventilated and drained, with good, high road-ways, and the general condition of each mine is good.

The coal in the mines in the vicinity of Richmond averages about 24 inches in thickness, with a good strong roof, which renders it well adapted to the long-wall method, as very little timber is required. A movable face-track is used, which is a great convenience to the miner in loading his coal.

The following is a description of the several mines of the company, together with a statement as to the condition we found each at date of inspection, April 10 and 11:

Mines Nos. 1 and 2 are located 1 mile west of Camden, each connected with the Wabash and Santa Fe R. R's. No. 1 has 10 chutes for coaling engines. The two shafts are equipped with good machinery; and are connected and working on the same face, and might properly be termed one mine with two openings. Ventilation is produced by a furnace, which we considered inadequate to meet the demands of the law; but the company contemplate the sinking of another shaft 1500 feet west of No. 2, and will in time move the machinery from No. 2 to No. 3, and erect a 12-foot fan at No. 2 to ventilate both mines. This will doubtless prove satisfactory. The coal is 18 inches thick, with a layer of slate 10 inches thick, which comes down with the coal, the same being used to build pack-walls to support the roof. We found all the safety appliances in good repair, high roadways, the mine dry and in general good condition.

Mines Nos. 3, 4 and 5 are located on the St. Joe branch of the Santa Fe R. B., 2 miles south of Richmond.

Mine No. 3 has a shaft 55 feet deep, equipped with steam-power for hoisting and draining. This mine is connected with No. 4, while No. 4 has an underground connection with No. 5, all three of which are working on the same coal face $1\frac{1}{4}$ mile in extent, and all three are ven-

tilated by the same fan, the same being set on top of an air-shaft near Mine No. 5. And, indeed, for all practical purposes the three mines may be called a mine with three openings.

We made careful examinations here on the 10th of April and found ventilation good, with a very strong current of air passing around the face of the workings; and, in fact, all other conditions connected with the mine were found satisfactory.

Mine No. 4 is located about 300 yards north of No. 3. It has a shaft about 75 feet deep for hoisting and draining. Machinery, cages and safety appliances were found in good repair.

Mine No. 5 is also a steam plant with shaft 75 feet deep. The same description of underground working applies here as that given of No. 3. Machinery, gates, cages, safety-catches and ropes were all found in good repair. Good road-ways are maintained between the three shafts to afford escapement from either in case of accident. This feature of the situation we closely examined by walking through the under-ground working of Nos. 3, 4 and 5. The coal averages about 24 inches in thickness. The pay for mining is at the rate of \$1 per ton the year round, the output being shipped to Kansas City and St. Joseph.

Mine No. 9 is located west of Richmond; shaft 95 feet deep; horse-power. It is operated only in the winter, and at the date of our visit was closed, no inspection being made. The company, we are informed, will sink another shaft this summer, west of Richmond, and equip it with good machinery, a contract for which had been let at the time of our visit. It is expected that the mine will be in operation by fall.

SWANWICK POSTOFFICE.

Williams Coal Co.—J. R. Williams, superintendent, and F. M. Lamb, foreman. Mine located at Swanwick, a station 5 miles north of Richmond, and connected with the St. Joe branch of the Santa Fe railroad; shaft 95 feet deep; horse-power. This mine has been in operation for 18 years and worked on an extensive scale. The coal runs irregular and faulty in places, which is unfortunate, not only for the employer, but the employe as well. Ventilation is produced by a furnace, which is set a short distance from the hoisting-shaft, and at the time of our visit was furnishing a sufficient amount of air for the number of men employed. About 25 men, on an average, are employed here, and the product is consumed at local points along the line of the said railroad.

SALINE COUNTY.

Production, 1865 tons.

Very little mining has been done thus far in Saline county, notwithstanding that over one-half of the county is underlaid with the coal measure formation.

The principal mines reporting as being operated during the past year are located in the vicinity of Mt. Leonard, Sweet Springs and Slater, although there are other local mines in operation during the fall and winter in other parts of the county.

Frank Alexander operates a mine at Arrow Rock, to supply winter trade.

Jas. M. Cordell operates a mine near Mt. Leonard. Shaft 50 feet deep; using horse-power for hoisting. Coal about 24 inches thick, and worked on the room-and-pillar plan.

Wm. Durnil operates a mine on Peter Durnil's land, near Elmwood. Drift opening. Coal 18 inches thick. Coal consumed at home.

W. A. Hedges operates a mine near Slater, to supply home trade.

Robert Thompson is operating a mine on Isaac Briggs' land near Slater. Drift opening. Supplying local trade.

J. V. Swaringer is operating the Marmaduke mine, near Sweet Springs. This is a shaft 60 feet deep; hoisting by horse-power, and ventilated by a furnace. The coal is about 24 inches thick, and is worked on the room-and-pillar plan.

From 8 to 12 men are employed in winter, to supply local demand.

Several of the smaller mines in this county have not been in operation during the last year, hence the product of the county has decreased.

SCHUYLER COUNTY.

Mining is prosecuted in various sections of this county, but only on a small scale. The only mines reporting as operated during the past year are located in the vicinity of Coatsville.

The coal is reported to be 45 inches in thickness, and is worked on the room-and-pillar method. Operating during the fall and winter, to supply local demand.

SULLIVAN COUNTY.

Production, 1000 tons.

Milan Land and Coal Co.—N. J. Winters, manager. Mine located at Milan and connected with the C. B. & K. C. R. R. Shaft 200 feet deep, equipped with good machinery. Hoisting is done with a pair of 200-horse-power engines, connected direct to the drum and supplied by two boilers. The pit-head and top buildings are well constructed, and furnish every convenience for the shipment of coal over two roads.

We made a careful examination of this mine on March 23, and found it had been badly managed and neglected. The coal is about 3½ feet thick, with a shale band an inch in thickness near the bottom. The roof is a hard soap-stone, and as is often experienced under like conditions where a new mine is opened, the roof when first exposed to the air crumbles and slakes. But this trouble is only temporary, as our experience has been that as the mine becomes well opened and the gas in the roof given an opportunity to exhaust itself, the roof sets and is not only better but harder and more easily secured. We regard this a good mine, and under proper management can be worked profitably; and as it is my desire to promote the mining industry of the State, I would like to see some good company in control of this mine.

Only 4 men at work at date of our visit.

The coal is consumed at Milan and pronounced to be of good quality for domestic purposes, and we also feel confident that it is a good steam coal.

The company has been notified to sink an escapement-shaft.

ST. CLAIR COUNTY.

Production, 6517 tons.

There are quite a number of mines in operation at various parts of St. Clair county, but operated only in a small way to supply local demand.

The most extensive mines in the county are located in the vicinity of Vista, where some coal is shipped by rail.

J. W. Alexander is operating a strip-pit at Appleton City, where the coal is consumed.

R. W. Allison operates a mine near Taborville. Slope opening. Coal 3 feet thick, and worked on the room-and-pillar method.

Bachelor Bros.—Mine is located near Appleton City. Strip mining.

W. L. Browning operates a mine at Lowry City. Slope opening. Coal 20 inches thick, and worked on the room-and-pillar plan. Coal consumed in the immediate vicinity.

Douthat & Vannice—Mine located at Vista. Slope opening, completed last year. The coal is about 40 inches thick, and worked on the room-and-pillar method.

About 20 men are employed. Coal shipped over the K. C., Ft. S. & M. R. R., and consumed at Springfield and other points along the line.

Ed. McDaniel is operating a strip-pit on Donahue's land, near Appleton City.

Jas. Allison is operating a strip-pit in the vicinity of Johnson City.

W. A. Seymour—Mine located 5 miles west of Osceola, known as the Hoover bank. The coal is about 30 inches in thickness, and worked on the room-and pillar plan. Coal hauled to Osceola, where it is consumed.

Wm. Watkins is operating the Johnson bank, located 3 miles west of Osceola, and hauling the coal in wagons to Osceola, where it is consumed.

VERNON COUNTY.

Production, 234,376 tons.

Vernon county leads all other counties in the State in per centage of increased production during the year just closed. The output of coal amounts to 234,376 tons, as against 119,036 tons for the previous year, being a gain of more than 96 per cent. The promise for as large a gain the coming year over the year just closed is warranted by the several large companies just entering this field with extensive plants and facilities for mining coal. The prospect looks very bright for this county, and, in fact, we shall be surprised if in a few years she does not forge to the front rank in the coal production of the State. To produce the above amount of coal, 316 men were employed in winter and 265 in summer, with an average of 28 mules working at the mines the entire year. Of the 32 mines operated this year 7 are shafts, 4 are slopes, 3 are drifts and 18 are strip-pits. Steam-power is employed at 5 and horse-power at 8 mines. There are 5 furnaces and 6 fans used in the ventilation of the mines.

The principal mines are located in the north part of the county, and the coal is taken to market over the Missouri Pacific and K. C., Ft. S. & M. railroads, which roads are connected with the mines by switches. Following is description of the principal mines:

CARBON CENTRE POSTOFFICE.

Carbon Centre—Very little mining is done at present; one drift mine is in operation, and a few strip-pits.

E. M. Hurt is operating a strip-pit. Shipping over the K. O., Ft. S. & M. R. R. Coal consumed at Kansas City.

Geo. Husleton—Mine located at Carbon Centre. Drift opening, being driven from the bottom of a strip-pit; coal hauled up by mules over an elevated road, dumped on cars, and shipped over the K. O., Ft. S. & M. R. R. to Kansas City.

The coal is 4 feet thick, overlaid with an excellent black shale roof. Worked on the room-and-pillar method. Mine is making considerable water, which comes from the strip-pit. About 15 miners employed at date of our visit, April 14.

J. N. Smith and Andy Scott are stripping coal, and shipping to Kansas City over the K. C., Ft. S. & M. R. R.

MOUNDVILLE POSTOFFICE.

J. M. Denon—Mine located near Moundville. Shaft 35 feet deep; hoisting by horse-power. Ventilation is produced by a furnace. Coal 28 inches thick, and worked on the room-and-pillar plan. Employing from 6 to 8 men. Coal shipped over the Mo. P. R. R. to Kansas City and Nevada.

Cooper & Son operate a mine on Dr. W. D. Robinson's land. Shaft 40 feet deep; horse-power. Coal 3 feet thick, and worked on the room-and-pillar plan. Employing from 8 to 10 men. Coal consumed at Nevada.

H. G. Mosher operates a drift mine at Schell City. Coal 2 feet thick, worked on room-and-pillar plan. Supplying local trade.

There are several parties working coal in the surroundings of Ketterman, Milo, Bellamy, Sheldon and Walker, by mining and stripping, to supply local demand.

RICH HILL POSTOFFICE.

Central Coal and Coke Co. (formerly known as Keith & Perry Coal Co.)—John Perry, manager; G. D. Manville, superintendent.

This company owns and is operating two mines within the borders of Vernon county, 3 miles south of Rich Hill, both of which are practically new. The following is a description of the mines as found at dates of inspection:

Mine No. 7—John H. Williams, foreman. This is undoubtedly a good mine, and ranks next to mine No. 15 of the Rich Hill Coal and

Mining Co. in equipment and capacity. The machinery and all the safety appliances were found in good order, the pit-head and top-works well constructed for convenience and economy. A revolving screen is connected with the tip-house to clean the coal, and the Ramsey box-car loader is used here, several grades of coal being loaded at same time on different tracks. The shaft was sunk in the spring of 1891, and a 4-foot seam of coal was found at a depth of 135 feet. We made two inspections of the mine during this year: First inspection was made on February 8, when the mine was running to its full capacity, putting out about 800 tons per day, giving employment to 200 miners. The ventilation is produced by a 14-foot fan, set on top of an air-shaft 700 feet from hoisting-shaft. Careful examination was made at all parts of the mine, and a good current of air was found circulating around the workings, with the exception of a few rooms which had been driven in a long distance and the cross-cuts left open, at which points we requested canvas to be put up.

Measurement of the air was taken near the up-cast, and we found 37,200 cubic feet passing per minute, and the fan making 70 revolutions in same time. Second inspection was made May 8, when the mine was again found in good condition, with a good current of air in circulation. The fan was making 72 revolutions per minute, removing 39,500 cubic feet of air in same time. Every precaution is taken by the company to secure the safety of the men. Shot-firers and gasmen are employed, and the miners are limited to a certain quantity of powder allowed to be taken into the mine at any one time; and no shot is allowed to be fired until all the men are out of the mine. Mining is done on the double-entry room-and-pillar plan. The pay is 50 cents per ton for unscreened coal the year round. The product is transported from the mine over the Mo. P. R'y, and is consumed (we are informed) by the K. C., Ft. S. & M. R. R. Co. The capacity of this mine has been increased to 1000 tons per day.

Mine No. 8—John A. Mackie, foreman. This mine is located 1½ mile south of Mine No. 7 and connected with the Mo. P. R'y. The shaft was sunk to a depth of 168 feet when coal was struck. The shipment of coal commenced in September, 1892.

At date of first inspection, February 9, 70 men were employed. An escapement-shaft was sunk immediately after completion of the main shaft, and arranged in two compartments; a stairway was put in on one side and a 10-foot fan erected over the other. The machinery was all in good order and well arranged, two boilers being used to gen-

erate the steam. The top buildings, tipple-house and revolving screens were found well constructed, and the ropes, brakes, cages, safety-catches and gates in good condition.

Unfortunately, this shaft was sunk at a point where the coal was not only thin, but it had a thick rock underlying it. This proves not only expensive working for the company but a decided disadvantage to the miner, who cannot possibly turn out as much coal as he would by the absence of this thick rock under-mining.

The ventilation was good in all parts of the mine, and Mr. Mackie is taking quite an interest in seeing that the doors are properly set and that all unused cross-cuts are tightly closed, which is of great benefit in ventilating a mine.

Second inspection was made of this mine on May 8, and found the north side had been abandoned owing to low and faulty coal, the work all being confined to the south side of the shaft. A self-acting incline plane had been constructed on the east side to let down the coal, the full cars pulling up the empties. Very little improvement was found in the coal. The ventilation was very good all over the mine. A careful inspection was made of all the abandoned parts. Mining done on the double-entry room-and-pillar plan, paying 50 cents per ton for unscreened coal.

About 40 men are employed. Coal transported over the Mo. P. R'y and consumed by the K. C., Ft. S. & M. R. R. Co.

Arthur Coal company—S. J. Hudson, president, Frank Williams, superintendent. This mine is located 5 miles south of Rich Hill, and $1\frac{1}{2}$ mile northeast of Arthur station.

Considerable stripping was done here at first, and a drift had been driven from the strip-pit under the hill. A furnace was erected to furnish the ventilation, but no inspection was made of the inside workings, as the mine had been closed down for the summer, and was full of water at date of our visit, May 9.

Bedford Coal company—This is a new mine, located 4 miles south of Rich Hill, and 1 mile from Bedford. The shaft was sunk last March, and a $4\frac{1}{2}$ -foot vein of coal was struck at 45 feet. The mine will be equipped with good machinery. The engine had been set and the boiler erected at date of our visit, April 14.

New ropes and pulleys were on the ground, and the pit-head and cages in course of construction. A pair of engines will be used, 10+14-inch cylinder, connecting direct to a $4\frac{1}{2}$ -foot drum. Made by the Keystone Iron works, of Kansas City, Mo.

A switch will be constructed from the mine connecting with the Mo. P. R'y, and will be ready for operation this fall.

Vernon County Coal Co.—Mine located 4 miles south of Rich Hill, and 1 mile from Bedford. Slope opening; hoisting by steam-power.

Mine opened in March, and all work was confined to entry-driving up to date of our visit.

A 10-foot fan had been erected, and preparations were made for an extensive mine. The coal is from 4 to 4½ feet thick, and overlaid with good shale roof. Good high roadways and fairly drained. Shipping connections will be made over the Mo. P. R'y.

The Rich Hill Coal Company owns and is operating two mines in this county, both of which are new and under the same management as the mines of Bates county. In fact, all of the mines of this company, located not only in this county but those in Bates county, are embraced within a radius of five miles.

Mine No. 16—Joe Davidson, foreman. This mine is located 4 miles south of Rich Hill, within the borders of Vernon county, close to its north line. This mine is entered by a slope, and the product is hoisted by steam-power. Operations at this mine were started last February, and the work was confined to driving entries up to date of inspection, April 13.

The coal is very irregular, runs into low coal and dips very rapidly east and south. Considerable water is encountered, but it is well handled. The roof is soft and friable, and great care is required in timbering. Coal runs from 3 to 5 feet thick, worked on the double-entry room-and-pillar plan, paying 50 cents per ton for unscreened coal. The product is shipped westward over the Mo. P. R'y.

Mine No. 17—Alex McKinnon, foreman. Mine located 3½ miles south of Rich Hill. Shaft was sunk last winter and a 4½-foot vein of coal was struck at a depth of 125 feet. Very little mining had been done at date of our visit. A fan had been erected and set on top of shaft to exhaust through an air chamber partitioned off the side of hoisting shaft. The machinery and pit-head, with top building, of Mine No. 14, will be moved, remodeled and set up at this mine. Connection has been made with the Mo. P. R'y by a switch, and the product will be shipped over that road to market.

TABULAR STATEMENTS.

REMARKS ON TABLE NO. 4.

The following table embraces in detail the coal mining operations of each county in the State producing coal, and from which may be seen as follows:

The kind of power used, with number of steam and horse-power plants in each county; also the kind of openings, shaft, slope, drifts and strip-pits, and the number of each in operation; number of mines per county, kind of ventilation, and the number of fans and furnaces used in producing ventilation; method of working—long-wall or pillar-and-room; number of kegs of powder used in mining coal and cost of same; number of miners employed in winter and the number in summer; the same as to other employes in and about the mines; number of fatal and non-fatal accidents; the total number of tons of coal produced by each county, the average price per ton received at the mines for coal, and the total amount received for the product.

We would state for the information of those not familiar with the manner in which reports are made to us by many operators, that where a disproportion of men employed to the output is apparent, that this may so appear in considering the full time of the season, yet in the majority of instances the number of men reported employed more than likely did work a certain length of time, but not for a full six months in either the winter or summer season; two and three months oftentimes cover the period worked.

The wide difference in prices received for coal by different counties may be explained from a variety of causes. Associated with the larger producing counties are transportation facilities, the larger companies, and of necessity competition, with the usual result, lowest prices. The large companies show a much less average price than do the great majority of other mines. The large concern operates the year round,

covering the season when prices and demand are the lightest, while the smaller concern suits its operations to the greatest demand and best prices. The effect of which is to reduce the general average price of the larger concern, while the smaller concerns secure on an average the best prices the year will afford. The many local mines in operation at certain seasons of the year, with but little competition, have much to do with swelling the general average price.

Table 5 represents each county, with the details of each mine in the respective counties, tabulated after the order and in the manner enumerated above.

TABLE IV—SHOWING BY COUNTIES THE CHARACTER,
MINES FOR THE YEAR.

Counties.	Kind of power.		Kind of opening.				Number of mines...	Kind of ventilation.		Mode of working.		No. of kegs powder used.....
	Steam.....	Home.....	Shaft.....	Slope.....	Drift.....	Strip-pit...		Furnace...	Fan.....	Long wall..	Pillar-and-room....	
Adair.....	1	4	3	3	1	.....	7	2	1	1	6	500
Andrain.....	4	5	9	.....	.....	.....	9	5	.....	7	2	14
Barton.....	3	1	2	4	8	8	23	.....	2	1	15	1,780
Bates.....	11	6	5	18	.....	20	45	2	13	.....	22	28,686
Boone.....	.....	5	5	6	2	4	17	5	.....	2	11	378
Caldwell.....	4	.....	4	.....	.....	.....	4	.....	2	.....	4	.....
Callaway.....	1	5	5	.....	3	.....	8	5	.....	6	2	108
Carroll.....	.....	3	3	.....	.....	1	4	.....	.....	1	2	2
Cedar.....	.....	.....	1	.....	.....	.....	5	.....	.....	.....	6	.....
Chariton.....	.....	2	2	1	2	.....	.....	.....	.....	2	.....	.....
Clay.....	1	.....	1	.....	.....	.....	1	.....	1	.....	1	50
Cole.....	1	.....	1	.....	.....	.....	1	.....	.....	.....	1	50
Cooper.....	1	1	2	1	2	.....	5	.....	.....	1	4	10
Dade.....	.....	6	.....	7	1	1	9	.....	.....	.....	8	8
Grundy.....	1	.....	2	.....	.....	.....	2	.....	1	.....	.....	65
Henry.....	6	12	15	4	1	18	33	6	5	7	13	2,444
Jackson.....	1	.....	1	.....	.....	.....	1	.....	1	1	.....	50
Johnson.....	1	1	2	8	5	1	16	2	.....	.....	15	138
Lafayette.....	8	19	26	5	18	.....	49	29	5	45	4	200
Linn.....	1	5	5	1	.....	.....	6	2	1	6	.....	2
Livingston.....	.....	1	1	.....	.....	.....	1	.....	.....	.....	1	.....
Macon.....	10	4	9	3	15	1	28	7	9	2	25	20,993
Montgomery.....	1	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....
Nodaway.....	.....	4	3	4	.....	.....	7	.....	.....	2	6	.....
Pettis.....	.....	1	1	.....	.....	1	2	.....	.....	.....	1	.....
Putnam.....	2	2	4	.....	8	.....	12	2	1	1	10	.....
Ralls.....	.....	1	1	.....	.....	.....	1	1	.....	1	.....	.....
Randolph.....	6	10	11	7	9	.....	27	13	5	2	25	3,233
Ray.....	11	9	20	2	8	.....	25	16	2	25	.....	.....
Saline.....	.....	2	2	1	3	1	7	1	.....	.....	5	.....
Schuyler.....	.....	1	.....	.....	2	.....	2	.....	.....	.....	2	.....
Sullivan.....	1	.....	1	.....	.....	.....	1	.....	.....	1	.....	80
St. Clair.....	.....	.....	5	1	4	.....	10	.....	.....	.....	6	2
Vernon.....	5	8	7	4	3	18	32	6	5	.....	14	10,761
Totals.....	80	119	154	85	92	73	404	100	54	117	211	64,853

TONNAGE AND VALUE OF OUTPUT OF MISSOURI COAL ENDING JUNE 30, 1893.

Cost of powder.....	Number of mules employed.		Employees.						Casualties.		Total number of tons mined.....	Average price received per ton.....	Amount received for output at mines....
			Miners.		Others.		Total.						
	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	Fatal..	Non-fatal..					
\$1,125 00	6	4	82	27	17	9	99	38	1	1	20,957	\$1 49	\$31,247 25
32 00	3	2	135	87	27	16	162	103	1	1	42,262	1 47	62,085 65
3,566 60	12	5	210	89	43	22	253	111	6	15	61,301	20 1/2	73,863 70
52,477 80	111	92	784	636	467	865	1281	1001	42	111	627,514	1 11	700,562 56
823 60	6	4	91	32	18	10	109	42	1	1	25,602	1 49	38,865 80
250 00	5	3	130	102	34	25	164	127	1	1	29,020	1 99	57,749 75
5 00	1	1	108	53	14	9	122	62	1	1	23,961	1 53	36,709 50
.....	.....	.....	9	1	2	.....	16	.....	.....	.....	1,088	2 33	2,544 00
.....	.....	.....	13	.....	3	.....	16	.....	.....	.....	890	1 46	1,299 00
.....	.....	.....	17	.....	1	.....	18	.....	.....	.....	1,136	1 92	2,190 00
100 00	.....	.....	60	50	17	15	77	65	.....	.....	7,139	1 50	10,398 77
100 00	1	1	3	2	1	1	4	3	.....	.....	1,200	1 35	1,620 00
22 50	.....	.....	18	4	1	.....	19	4	.....	.....	2,892	1 99	5,721 50
12 75	2	2	59	16	3	3	62	19	.....	.....	6,695	1 50	10,042 50
146 25	5	5	135	125	30	29	165	154	.....	.....	35,770	2 05	73,328 50
4,541 75	16	14	419	264	108	79	527	343	.....	2	125,962	1 47	185,643 77
70 00	.....	.....	40	55	7	7	47	62	.....	.....	4,819	2 00	9,638 00
368 00	.....	.....	71	24	8	3	79	27	.....	1	12,101	1 59	19,228 75
400 00	30	24	1271	696	193	137	1464	833	3	6	371,928	1 48	551,528 96
5 00	3	3	132	107	19	16	151	121	.....	.....	48,302	1 57	75,850 81
.....	.....	.....	5	2	2	2	7	4	.....	.....	1,000	1 75	1,750 00
37,540 25	116	105	1235	1058	465	314	1700	1402	8	.....	788,563	1 04	824,478 26
.....	2	2	40	30	10	10	50	40	.....	.....	15,923	1 35	21,496 05
.....	.....	.....	39	6	1	.....	40	6	.....	.....	2,545	2 54	6,487 25
.....	.....	.....	4	.....	.....	.....	4	.....	.....	.....	181	1 79	324 50
.....	15	13	318	230	64	63	382	293	.....	.....	145,641	1 36	198,357 43
.....	.....	.....	12	12	3	3	15	15	.....	.....	2,160	1 45	3,132 00
6,591 50	27	24	577	354	109	76	686	430	1	1	219,762	1 11+	245,720 61
.....	30	23	908	510	175	97	1083	807	.....	.....	319,405	1 52	488,531 08
.....	.....	.....	15	5	6	2	21	7	.....	.....	1,865	2 15	4,018 50
.....	.....	.....	8	.....	1	.....	9	.....	.....	.....	962	1 25	1,202 50
160 00	1	.....	4	3	3	3	7	6	.....	.....	1,000	1 75	1,750 00
4 50	2	2	38	14	9	3	47	17	.....	.....	6,517	1 56	10,171 50
23,849 40	28	28	315	285	86	93	401	358	.....	.....	234,376	1 04	244,883 02
132,131 90	424	357	7285	4859	1947	1442	9232	6301	21	26	3,190,442	1 253	3,909,681 17

TABLE IV—SHOWING BY COUNTIES THE CHARACTER,
MINES FOR THE YEAR

Counties.	Kind of power.		Kind of opening.				Number of mines.	Kind of ventilation.		Mode of working.		No. of kegs powder used.
	Steam.....	Horse.....	Shaft.....	Slope.....	Draft.....	Strip-pit....		Furnace....	Fan.....	Long wall..	Pillar-and-room....	
Adair.....	1	4	8	3	1	.....	7	2	1	1	6	509
Andrain.....	4	5	9	.....	.....	.....	9	3	.....	1	2	14
Barton.....	3	1	2	4	8	8	23	.....	2	1	15	1,780
Bates.....	11	6	5	18	.....	20	43	2	12	.....	22	23,696
Boone.....	.....	5	5	6	2	4	17	5	.....	2	11	378
Caldwell.....	4	.....	4	.....	.....	.....	4	.....	2	.....	4	.....
Callaway.....	1	5	5	.....	3	.....	8	8	.....	6	2	108
Carroll.....	.....	3	3	.....	.....	1	4	.....	.....	1	2	2
Cedar.....	.....	.....	.....	1	5	.....	6	.....	.....	.....	6	.....
Chariton.....	.....	2	2	1	2	.....	5	.....	.....	2	.....	.....
Clay.....	1	.....	1	.....	.....	.....	1	.....	1	.....	1	50
Cole.....	1	.....	1	.....	.....	.....	1	.....	.....	.....	1	50
Cooper.....	1	1	2	1	2	.....	5	.....	.....	1	4	10
Dade.....	.....	6	.....	7	1	1	9	.....	.....	.....	8	8
Grundy.....	1	.....	2	.....	.....	.....	2	.....	1	1	.....	65
Henry.....	6	12	15	4	1	18	33	6	5	7	13	2,444
Jackson.....	1	.....	1	.....	.....	.....	1	.....	1	1	.....	50
Johnson.....	1	1	2	8	5	1	16	2	.....	.....	15	138
Lafayette.....	8	19	23	5	18	.....	49	29	5	45	4	200
Linn.....	1	5	5	1	.....	.....	6	2	1	6	.....	2
Livingston.....	.....	1	1	.....	.....	.....	1	.....	.....	.....	1	.....
Macon.....	10	4	9	3	15	1	28	7	9	2	25	20,993
Montgomery.....	1	.....	1	.....	.....	.....	1	.....	1	1	.....	.....
Nodaway.....	.....	4	3	4	.....	.....	7	.....	.....	2	6	.....
Pettie.....	.....	1	1	.....	.....	1	2	.....	.....	.....	1	.....
Putnam.....	2	2	4	.....	8	.....	12	2	1	1	10	.....
Balls.....	.....	1	1	.....	.....	.....	1	1	.....	1	.....	.....
Randolph.....	6	10	11	7	9	.....	27	13	5	2	25	3,332
Ray.....	11	9	20	2	3	.....	25	16	2	25	.....	.....
Saline.....	.....	2	2	1	3	1	7	1	.....	1	5	.....
Schnyler.....	.....	1	.....	.....	2	.....	2	.....	.....	.....	2	.....
Sullivan.....	1	.....	1	.....	.....	.....	1	.....	.....	1	.....	80
St. Clair.....	.....	.....	.....	5	1	4	10	.....	.....	.....	6	2
Vernon.....	5	8	7	4	3	18	32	6	5	.....	14	10,761
Totals.....	80	119	154	85	92	73	404	100	54	117	211	64,553

CHARACTER, TONNAGE AND VALUE OF OUTPUT OF COAL YEAR ENDING JUNE 30, 1893.

COUNTY.

Mode of working.	Average thickness of vein.	No. of kegs powder used during year.	Cost of powder for the year.	Mules	Employees.						Av. price per ton for mining.		Total number of tons mined.	Average value per ton at mine	Amount received for the total output of the year.	
					Miners.			Others.								Total.
					Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.				
Long-wall.	Pillar and room.															
.....	1	4	.....	.....	6	3	1	.....	7	3	75	75	900	\$1 25	\$1,125 00
.....	1	3:2	.....	.....	2	2	.....	.....	2	2	.....	.....	20	2 25	45 00
.....	1	3:6	.....	1	2	2	.....	.....	4	.....	1 00	.....	400	1 50	600 00
.....	1	3:6	500	\$1125 00	28	24	7	7	35	31	1 00	87½	9,787	1 75	17,127 25	
.....	1	3:6	.....	.....	35	.....	4	2	39	2	1 00	80	7,500	1 25	9,375 00
.....	1	4	.....	.....	.....	.....	.....	.....	10	.....	75	.....	2,200	1 25	2,750 00
.....	1	3	.....	.....	1	.....	1	.....	2	.....	80	.....	150	1 50	225 00
1	6	.....	500	\$1125 00	6	4	82	27	17	9	99	88	20 957	1 49	31,247 25

COUNTY.

1	2:5				10	10			10	10	1 00	1 00	6,090	1 50	9,135 00
1	2:6				4	2	1		5	2	1 00	1 00	526	1 75	920 50
1	3	2	5 00		2				3		1 00		120	2 00	240 00
1	4:6			1	2		1		3		87½		100	1 50	150 00
1	2:6				30	20	4	3	34	23	92	92	6 597	1 45	9,565 65
1	2:4				20	10	6	4	28	14	90	90	2,294	1 75	4,014 50
1	2:4	12	27 00		7	2			7	2	1 25	1 25	100	1 90	190 00
1	2:4				10	3	2	1	12	4	1 00	1 00	1,435	2 00	2,870 00
1	2:6			2	2	50	40	12	8	62	48	86	25,000	1 40	35,000 00
7		14	32 00	3	2	135	87	27	16	162			42,262	1 47	62,085 5
2															

COUNTY.

1	1				3				3				125	\$2 00	\$250 00
1	2:6				3		1		4	1	1 00	85	400	1 45	580 00
1	2:4				2	2			2	2	1 25	1 25	850	1 37½	1,142 25
1	2	3	\$6 60		2				2		1 00		40	1 75	70 00
1	2				2				2		1 00		160	1 50	240 00
1	1:4				5	3			5	3	1 25	1 25	350	2 00	700 00
1	1:2				2				2				300	2 00	600 00
1	1:2				5	4			5	4			400	2 00	800 00
1	2:2				4				4		75		1,000	1 50	1,500 00
1	2:4				2	1			2	1			140	1 50	210 00
1	1	17	40 00		5	1			5	1			500	2 00	1,000 00
1	3:2			6	60		15		75		57		5,850	1 12½	6,581 25
1	2:6			2	2	30	3	3	38	23	70	60	7,660	1 25	9,588 00
1	1:2				5				5				120	1 60	192 00
1	1:3				2	1			2	1			40	1 75	70 00
1	2:6				2				2		1 00		300	1 25	375 00
1	1				2	1			2	1	1 12	1 12	160	2 00	320 00
1	1:4				4				4		1 00		72	2 50	180 00
1	3	1758	3516 00	4	3	66	54	23	17	89	71	70	41,374	1 15	47,580 70
1	2:2	2	4 00		2	1			2	1	1 00		80	1 37½	110 00
1	3:6				2				2		70		1,200	1 25	1,500 00
1	2:6								2				200	1 57½	275 00
1	15	1780	3560 60	12	5	210	89	43	22	253			61,501	1 50½	78,698 70

TABLE V — NAME OF PROPRIETORS AND OPERATORS,
MINES IN MISSOURI, FOR

ADAIR

Name of company.	Operator.	Kind of power.		Kind of opening.			Depth of shaft—feet.	Kind of ventilation.		Diameter of fan
		Steam	Horse	Shaft	Slope	Drift		Furnace	Fan	
Besanko mine	Lounger & McCabe	1	1	1	1	1	20	1	1	10
Ford, A.	Same	1	1	1	1	1	50	1	1	10
Ledford, Jacob	"	1	1	1	1	1	60	1	1	10
McCahan, H. C.	McCahan, H. C.	1	1	1	1	1	60	1	1	10
Pennsylvania Coal Co.	Same	1	1	1	1	1	60	1	1	10
Scott, D. C.	"	1	1	1	1	1	60	1	1	10
Stanley, L. H.	"	1	1	1	1	1	60	1	1	10
Totals .....	.....	1	4	3	3	1	.....	2	1	.....

AUDRAIN

Audrain Mfg Co	Dixon, C	1	1	1	1	1	65	1	1	10
Detienne, O. J.	Same	1	1	1	1	1	40	1	1	10
Eastham, C. F.	"	1	1	1	1	1	30	1	1	10
McGuire, Martha	McGuire, Sam'l	1	1	1	1	1	16	1	1	10
Martinsburg Coal Co	Same	1	1	1	1	1	107	1	1	10
Sherman, Bethel & Smith	"	1	1	1	1	1	104	1	1	10
Silvers, L.	Redifer, P. A.	1	1	1	1	1	32	1	1	10
Turpin, C.	Same	1	1	1	1	1	60	1	1	10
Vandalia Coal Co	"	1	1	1	1	1	72	1	1	10
Totals .....	.....	4	5	9	1	1	.....	3	1	.....

BARTON

Bacon, W. S.	Same	1	1	1	1	1	1	1	1	10
Betz Bros	"	1	1	1	1	1	1	1	1	10
Boulware Bros	Lavery Bros	1	1	1	1	1	1	1	1	10
Cameron, C. J.	Same	1	1	1	1	1	1	1	1	10
Campbell, John	"	1	1	1	1	1	1	1	1	10
Clark, Wilson	Becker, H.	1	1	1	1	1	1	1	1	10
Clark, W. C.	Same	1	1	1	1	1	1	1	1	10
Cole, M.	"	1	1	1	1	1	1	1	1	10
Gilkey, E.	Helm, P. L.	1	1	1	1	1	1	1	1	10
Hanshaw's Mine	Heston & Brown	1	1	1	1	1	1	1	1	10
Kimball, Daniel	Same	1	1	1	1	1	1	1	1	10
Lanyon, S. H.	"	1	1	1	1	1	40	1	1	10
Liberal Coal Co	"	1	1	1	1	1	1	1	1	10
Parry, Mrs. W.	Glaze, G. W.	1	1	1	1	1	1	1	1	10
Rising's Bank	Franklin, B. D.	1	1	1	1	1	1	1	1	10
Ryan, G. G.	Same	1	1	1	1	1	1	1	1	10
Spear, M. M.	"	1	1	1	1	1	1	1	1	10
Sturdevant Mine	Misner, G. E.	1	1	1	1	1	1	1	1	10
The Wear Coal Co	Same	1	1	1	1	1	45	1	1	10
Titus & Newton	"	1	1	1	1	1	1	1	1	10
Waite, C. G.	Snyder, Wm	1	1	1	1	1	1	1	1	10
Whitsell, H. J.	Same	1	1	1	1	1	1	1	1	10
Totals .....	.....	2	1	2	4	8	8	2	1	.....

AND VALUE—Continued.

COUNTY.

Mode of working	Average thickness of vein.	No. of kegs powder used during year.	Cost of powder for the year	Mules.		Employees.						Av. price per ton for mining.		Total number of tons mined	Average value per ton at mine	Amount received for the total output of the year	
				Winter.	Summer.	Miners.		Others.		Total.	Winter.	Summer.	Winter.				Summer.
						Winter.	Summer.	Winter.	Summer.								
1	2:9	8	16 00	2	..	20	..	3	..	3	..	50	..	500	1 25	625 00	
1	3:6	75	135 00	2	..	20	..	3	..	3	..	50	..	4,800	1 25	6,000 00	
1	4	600	1200 00	9	9	20	15	8	6	28	21	50	50	12,000	1 20	14,400 00	
1	3:2	10	20 00	..	..	2	..	..	..	2	..	..	..	1,140	1 00	1,140 00
1	2:6	12	24 00	..	..	2	..	3	..	3	..	..	..	1,000	1 25	1,250 00
1	3	30	60 30	..	..	9	4	..	..	9	4	..	..	240	1 37½	330 00
1	3:6	20	40 00	..	..	20	15	3	..	20	15	..	..	2,000	1 25	2,500 00
1	5:6	20	48 00	2	2	4	1	2	3	8	4	..	..	4,000	1 12½	4,500 00
1	3:6	25	50 00	..	..	4	2	..	..	4	2	..	..	589	1 25	726 25
1	3	50	100 00	..	..	..	..	18	..	18	..	..	..	2,400	1 25	3,000 00
1	3:2	40	80 00	1	..	10	..	2	..	12	..	75	..	1,500	1 25	1,875 00	
1	2:10	70	140 00	1	1	5	7	1	1	6	8	80	80	2,500	1 12½	2,812 50	
1	4:6	35	60 00	..	..	3	..	..	..	3	..	..	..	6,000	1 17	7,020 00
1	4:8	480	960 00	4	4	20	20	6	6	28	26	50	50	1,800	1 00	1,800 00	
1	2:6	100	200 00	..	..	2	2	2	2	2	2	..	..	1,500	1 40	2,100 00
1	5:6	20	80 00	2	2	3	2	1	1	4	3	..	..	1,211	1 25	1,513 75
1	5	80	160 00	1	..	6	..	..	..	6	..	..	..	7,000	1 15	8,050 00
1	2:10	50	105 00	1	1	4	4	1	1	5	5	75	75	2,500	1 18½	2,938 75	
1	4:3	3118	7,015 50	12	4	70	55	22	17	92	72	69	69	300	1 00	300 00	
1	4:2	1468	3,303 00	6	6	40	40	18	18	58	58	69	69	2,000	1 25	2,500 00	
1	4	4992	11,232 00	15	17	120	110	50	45	170	155	69	69	1,680	1 37½	2,310 00	
1	3:9	633	1,424 25	10	10	145	145	145	145	20	20	48	48	962	1 37½	1,322 75	
1	3:9	9145	20,576 25	15	15	250	225	75	70	325	295	50	50	60	260	110	66,286 00
1	3:9	56	128 00	4	4	4	4	4	4	8	8	50	50	16,230	1 10	17,853 00	
1	4	762	1,714 50	10	10	70	70	20	20	90	90	50	50	18,184	1 15	20,912 17	
1	4	60	120 00	..	..	..	..	16	..	16	..	..	..	107,787	1 10	118,565 62
1	4	25	50 00	4	4	3	3	..	..	3	3	..	..	48,491	1 25	60,614 02
1	4	75	150 00	1	1	4	2	2	2	6	4	60	60	195,464	1 10	215,011 00	
1	3	222	333 00	1	1	20	10	8	3	23	13	90	81½	1,418	1 00	1,418 00	
1	2:6	20	40 00	10	4	5	2	4	9	9	11	..	..	67,271	1 10	73,998 48
1	3	10	20 00	..	..	..	..	..	..	..	..	..	..	3,440	1 00	3,440 00
1	2:6	800	1,600 00	..	..	..	..	16	..	16	..	..	..	4,800	1 25	6,000 00
1	4	25	50 00	4	4	3	3	..	..	3	3	..	..	1,800	1 25	2,250 00
1	4	78	156 00	1	1	4	2	2	2	6	4	60	60	3,427	1 00	3,427 00	
1	3	222	333 00	1	1	20	10	8	3	23	13	90	81½	5,282	1 40	7,386 37	
1	2:6	20	40 00	10	4	5	2	4	9	9	11	..	..	1,458	1 20	1,750 00
1	3	10	20 00	..	..	..	..	..	..	..	..	..	..	320	1 50	480 00
1	2:6	800	1,600 00	..	..	20	..	7	..	27	..	51½	51½	1,223	1 25	1,528 75
1	4	..	..	..	..	..	..	..	..	..	..	..	..	25,009	95	23,758 55
1	4	..	..	..	..	..	..	..	..	..	..	..	..	6,428	75	4,819 60
22	..	23,696	52,477 80	111	92	764	636	467	365	1231	1001	..	..	627,514	1.1164	700,562 56

CHARACTER, TONNAGE

CALDWELL

Name of company.	Operator.	Kind of power.		Kind of opening				Depth of shaft—feet.	Kind of ventilation		Diameter of fan
		Steam.....	Horse.....	Shaft.....	Slope.....	Drift.....	Strip-pit...		Furnace...	Fan	
Caldwell Coal Co	Same	1		1				465		1	10
Cowgill Mining Co	Beavis & Switzler	1		1				340			
Hamilton Coal Co	Same	1		1				310		1	10
Kingston Coal Co	"	1		1				268			
Totals .....	.....	4		4						2	

CALLAWAY

Castle, William	Same					1					
Crews & Thurmond	A. Harris	1	1					60			
Criswell, A. W.	Robert Henderson					1					
Fulton Fire-brick and Mfg. Co.	Same	1	1					101	1		
Henderson, J. S.	Benfrew & White	1	1					25			
Harris, John	Same	1	1					40			
Smith, James	John Marsenkoff	1	1					50	1		
Smith, James	James Smith	1	1			1			1		
Totals .....	.....	1	5	5		3			3		

CARROLL

Farr, Ralph	Same						1				
Jenkins, David	"	1	1					16			
Mayview Mine	Henry Smith	1	1					14			
Wallace, Presley	Wallace & Harvey	1	1					15			
Totals .....	.....		3	3			1				

CEDAR

Ashenfelter, F. G.	D. Long & A. Herman					1					
Davis, A. B.	Same					1					
Duncan, J. C.	"				1						
Pickett, E. D.	W. B. Packard					1					
Roage, G. M.	Same					1					
Stratton, D. G.	J. S. Cole					1					
Totals .....	.....				1	5					

CHARITON

Callison, J. M.	M. B. Prather	1	1					30			
Faller, Joseph	Same						1				
Huerten, John	R. Brewer					1					
Iale, R. W.	Same						1				
Williams, C. M.	"	1	1					60			
Totals .....	.....	2	2			1	2				

AND VALUE—Continued.

COUNTY.

Mode of working.	Average thickness of vein	No. of legs powder used during year	Cost of powder for the year	Mules.		Employees.						Av. price per ton for mining.		Total number of tons mined.	Average value per ton at mine.	Amount received for the total output of year	
				Winter	Summer	Miners.		Others.		Total.	Winter	Summer	Winter				Summer
						Winter	Summer	Winter	Summer								
Pillar-and-room.	Long wall.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
...	...	1:7
...	...	2:2
...	...	1:8
...	...	1:10
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COUNTY.

1	2:4					5	2	1	6	2	1 10	1 10	1,432	1 50	2,148 00	
1	2:6					9	8	1	1	10	9	1 00	1 00	1,799	1 50	2,698 50
1	2					1			1					100	2 00	200 00
1	2:6					65	40	6	6	71	46	1 00	1 00	13,000	1 50	19,500 00
1	2:8					4	2	1	1	5	3	1 00	1 00	800	1 50	1,200 00
1	2:6					12	2	2	1	14	4	1 00		3,000	1 50	4,500 00
1	2	108	250 00	1	1	8	1	1	1	4	2	1 20	1 20	720	1 50	1,080 00
1	2:6			1		9		2		11		1 00		8,110	1 75	5,448 00
6	2	108	250 00	2	1	108	53	14	9	122	62			23,961	1 53	36,769 50

COUNTY.

1	2					1	1		1	1			240	\$1 75	\$420 00
1	1:8	2	\$5 00	1		5		1	6		1 25		800	2 50	2,000 00
1	1:8					2		1	3		1 25		8	8 00	24 00
1	1:10					1			1				40	2 50	100 00
1	2	2	5 00	1		9	1	2	11	1			1,088	2 33	2,544 00

COUNTY.

1	2:3					2			2		80		120	\$1 20	\$144 00
1	2					1			2		1 00		240	1 50	360 00
1	2					2			1				80	1 50	120 00
1	2					3			3		1 00		70	1 50	105 00
1	1:4							2	6		1 00		300	1 50	450 00
1	2:6					1		1	2		1 00		80	1 50	120 00
6						18		3	16				890	1 46	1,299 00

COUNTY.

1	2					6			6		1 25		700	1 75	1,225 00
1	1:6					1			1				4	2 50	10 00
1	1:8					2			2				100	2 00	200 00
1	1:4					1			1				32	2 50	80 00
1	1:7					7		1	8		1 50		800	2 25	675 00
2	1					17		1	18				1,186	1 92	2,190 00

CHARACTER, TONNAGE

CLAY

Name of company.	Operator.	Kind of power.		Kind of opening.				Depth of shaft—feet.	Kind of ventilation.		Diameter of feet.....
		Steam.....	Horse.....	Shaft.....	Slope.....	Delt.....	Strip-pit.....		Furnace.....	Fan.....	
North Kansas City C. & M. Co..	Same.....	1		1				435		1	20

COLE

Leach, Geo. H. & Co	Same.....		1	1				150			
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COOPER

Hazell, Chas. W	Same.....					1					
Jenkins, H. W	"					1					
Missouri Valley C. & M. Co.....	"	1		1				100			
Palmberg, A	"		1	1				100			
Smith, Lesley	"				1						
Totals.....		1	1	2	1	2					

DADE

Clayton, W. R.....	Same.....				1						
Gardner & Carson	F. A. Jones.....		1		1						
McArthur, T.	F. A. Jones.....		1		1						
McCluey, Robt	Same		1		1						
McCombe's mine	E. M. Sharpe.....		1		1						
McGarvey's mine	Ell Zook		1		1						
McGarvey's Sam'l Est	Jas. Henson		1		1						
Seaton, J. R	O. P. Ramsey					1					
Shoemaker, J. K	Wm. Shoemaker						1				
Totals			6		7	1	1				

GRUNDY

Grundy County Coal Co.....	Same.....	1	{	1				188 210	}	1	10
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AND VALUE—Continued.

COUNTY.

Amount received for the total output of the year.....	Average value per ton at mine.	Total number of tons mined.....	Av. price per ton for mining.		Employees.			Mules.	Cost of powder for the year.....	No. of bags powder used during year ..	Average thickness of vein.	Mode of working.		
					Miners.	Others.	Total.							
													Summer.	Winter..
10,398 77	1 50	7,139	1 12½	1 25	65	77	15	17	50	60	

COUNTY.

1	15	50	100 00	1	1	3	2	1	1	4	3	1,200	1 35	1,620 00
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COUNTY.

1	1:6	2	...	1	...	3	...	1 37½	...	250	1 75	437 50
1	1:6	2	...	1	...	2	...	1 37½	...	80	2 00	160 00
1	1:2	8	4	8	4	75	75	1,727	2 00	3,454 00
1	1:3	10	22 50	...	1	...	...	...	1	...	62½	...	160	2 00	320 00
1	1:3	...	...	...	5	...	...	...	5	...	1 25	...	675	2 00	1,350 00
1	4	10	22 50	...	...	18	4	1	...	19	4	...	2,892	1 99	5,721 50

COUNTY.

1	2:3	8	12 75	...	12	4	1	1	13	5	1 00	1 00	2,420	1 50	3,630 00
1	2:3	...	...	...	3	1	...	...	3	1	1 00	1 00	480	1 50	720 00
1	2:3	...	...	1	3	1	...	...	3	1	1 00	1 00	520	1 50	780 00
1	2:3	...	...	...	12	...	...	...	12	...	1 00	...	700	1 50	1,050 00
1	2:3	...	...	...	4	2	...	...	4	2	1 00	1 00	550	1 50	825 00
1	2:3	...	...	1	6	1	1	1	7	2	1 00	1 00	552	1 50	828 00
1	2:3	...	...	...	10	4	1	1	11	5	1 00	1 00	750	1 50	1,125 00
1	2:3	...	...	...	8	3	...	...	8	3	1 00	1 00	899	1 50	1,348 50
...	3	...	...	...	1	...	...	...	1	...	...	...	24	1 50	36 00
8	...	8	12 75	2	2	59	16	3	3	62	19	...	6,695	1 50	10,042 50

COUNTY.

1	1:3	65	148 25	5	5	135	125	30	29	165	154	{ 1 25 1 12½	{ 1 12½ 1 06¼	35,770	2 05	73,323 50
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CHARACTER, TONNAGE

CLAY

Name of company.	Operator.	Kind of power.		Kind of opening.				Depth of shaft—feet.	Kind of ventilation.		Diameter of feet.
		Steam.....	Horse.....	Shaft.....	Slope.....	Drift.....	Strip-pit..		Furnace...	Fan.....	
North Kansas City C. & M. Co..	Same.....	1	...	1	435	..	1	20

COLE

Leach, Geo. H. & Co	Same.....	...	1	1	150
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COOPER

Hazell, Chas. W	Same	1
Jenkins, H. W	"	1
Missouri Valley C. & M. Co.....	"	1	..	1	100
Palmborg, A	"	1	1	100
Smith, Lesley .....	" .....	..	..	..	1	..	..	..	..	..	..
Totals.....	.....	1	1	2	1	2	..	..	..	..	..

DADE

Clayton, W. R.	Same .....	..	..	..	1	..	..	..	..	..	..
Gardner & Carson.....	F. A. Jones.....	..	1	..	1	..	..	..	..	..	..
McArthur, T.	F. A. Jones.....	..	1	..	1	..	..	..	..	..	..
McCluey, Robt	Same .....	..	1	..	1	..	..	..	..	..	..
McCombe's mine	R. M. Sharpe.....	..	1	..	1	..	..	..	..	..	..
McGarvey's mine	Ell Zook .....	..	1	..	1	..	..	..	..	..	..
McGarvey's Sam'l Est	Jas. Henson .....	..	1	..	1	..	..	..	..	..	..
Seaton, J. R.	O. P. Ramsey .....	..	..	..	1	..	..	..	..	..	..
Shoemaker, J. K	Wm. Shoemaker	1
Totals	6	..	7	1	1

GRUNDY

Grundy County Coal Co.....	Same.....	1	{	1	188 210	{	1	10
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AND VALUE—Continued.

COUNTY.

Mode of work- ing.	Average thickness of vein.	No. of kegs powder used during year.	Cost of powder for the year.	Males.		Employees.						Av. price per ton for mining.		Total number of tons mined.	Average value per ton at mine.	Amount received for the total output of the year.
				Winter.	Summer.	Miners.		Others.		Total.		Winter.	Summer.			
						Winter.	Summer.	Winter.	Summer.	Winter.	Summer.					
1	8					12	1			12	1	1 50	1 50	2,000	\$1 50	\$3,000 00
1	1:5					2	8			2	9	2 75	75	200	2 12½	525 00
1	4:8	25	50 00			8	2	1		9	2	75	75	1,267	1 75	2,217 25
1	3:2	50	87 50			15	8	2		17	10	85	90	679	1 62½	1,033 87
1	2:6	80	45 00	1	1	38	30	4	4	40	34	85	85	10,580	1 42	15,023 60
1	2:8	900	1800 00	6	6	56	56	30	30	86	86	85	75	35,020	1 50	52,530 00
	1:4					2	1			2	1			380	1 75	670 00
	2:6	120	240 00			20	20	5	5	25	25	85	85	4,697	1 40	6,556 50
	3:6	600	960 00	1	1	50	30	8	6	58	38	95	85	12,000	1 51	18,120 00
	3	300	450 00			45	30	6	6	51	36	85	75	19,838	1 50	28,999 00
	3:4	20	35 00			8				8				500	1 50	750 00
	4:6	6	12 00					2		2				120	1 25	150 00
	1:3					6				6				40	2 00	80 00
	2:6	1	2 75	1	1	15	3	2		17	3	1 00		1,500	1 50	2,250 00
	2:6	50	75 00	1	1	8	3	8	8	8	15	1 00	1 00	107	1 75	187 25
	1	100	200 00			5	6	2		7	6	1 00	1 00	800	1 50	1,200 00
	1:2					1				1				500	1 68	840 00
	2	2	4 50			1	1	1		2		1 25		3,607	1 50	5,260 50
	2:8	160	320 00	2	2	15	10	3	2	13	12	90	80	80	1 50	120 00
	2:6	30	60 00			9	4	6	3	15	7	75	75	150	2 00	300 00
	2:6	20	35 00			10	2	1	1	11	3	1 25	1 25	5,000	1 37½	6,875 00
	3					8				8				160	1 50	240 00
	3:8	15	35 00			20	10	5	5	25	15	85	85	1,693	1 75	2,694 15
	4					3	1	5	2	3	1	1 00	1 00	918	2 00	1,836 00
	2:8			1	1	3	1	5	2	3	1			400	1 50	600 00
	1:4					2	1			2				400	1 25	500 00
	2:6	15	30 00	3	3	40	40	15	10	55	50	85	85	6,000	1 85	8,000 00
	1									1				1,700	1 25	2,125 00
														245	1 75	428 75
														360	1 75	630 00
														14,886	1 40	20,812 40
														80	2 00	160 00
7	13	2444	4511 75	16	15	419	264	108	79	527	343			125,962	1 47	185,643 77

COUNTY.

1	2	50	70 00	40	55	7	7	47	62	1 82½	1 50	4,819	2 00	9,638 00
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COUNTY.

1	1:4	130	\$293 00	18	9	3	3	16	12	62½	62½	84	\$2 00	\$68 00
1	3:10			8	2	1		9	2	87½	87½	4,990	1 40	6,986 00
1	2:6			8				9				1,030	1 40	1,442 00
1	2:6			2				2				120	1 50	180 00
1	2:4	8	16 00	6				8	6	87½	75	800	1 25	1,000 00
1	1:10			1				1				40	1 25	50 00
1	1:9			4				4		1 00		240	1 50	360 00
1	1:6			8	6			8	6	1 50	1 25	2,490	2 12½	5,237 25
1	2:6			6	1			6	1	78½	76½	500	1 00	500 00
1	1:8			2		1		3		1 00		150	2 00	300 00
1	1:6			2				2		1 00		50	2 00	100 00
1	2			3	1			3		1 00		220	1 87½	302 50
1	2:6			2				2		87½		262	1 50	393 00
1	1:6			3				3		1 25		360	1 75	630 00
1	1:6					1		1				15	2 00	30 00
1	1:11			8	2			10		1 87½		800	2 00	1,600 00
15		138	308 00	71	24	8	8	79	27			12,101	1 59	19,228 75

CHARACTER, TONNAGE

LAFAYETTE

Name of company.	Operator.	Kind of power.		Kind of opening.				Depth of shaft—feet.	Kind of ventilation		Diameter of fan
		Steam	Horre	Shaft	Slope	Drift	Strip-pit		Furnace	Fan	
Armstrong, Joseph	Harvey St Clair		1	1				34			
Bell, W. H.	Same		1	1				25			
Bell & Greer	W. H. Greer				1				1		
Bonanza Coal Co	Same		1	1				70	1		
Bruce & Knoble	J. O. Bruce		1	1				45	1		
Carter, Andrew	Same				1				1		
Clark, Thomas	Kelley Coal Co.		1		1						
Coleman, Frank	Same				1						
DeBolt, I. H.					1						
Dover Coal Co	"				1				1		
Duncan, Chas. E.	"				1				1		
Excelsior Coal & Coke Co.	"	1		1				70		1	10
Farmers' Coal & Mining Co.	Beatty, Jones, Campbell		1	1				40	1		
Fox, N. F.	Same		1	1				40	1		
Franko, John	"		1	1				84			
Francisco, H. C.	C. O. Godfrey	1		1				110		1	10
*Haywood Coal Co	Gunn Bros		1	1				18	1		
Hawkins & Smith	J. E. Wilkes		1	1				72	1		
Hendrick, S. B.	I. P. Hendrick				1						
Hollowell, Michael	Same		1	1				60			
Keist, Joseph	Louis Keist				1						
Kresac, A. F.	Same		1	1				20			
Krentz, Fred, Jr.	Arthur Garrett				1				1		
Lafayette Coal Co	Same				1						
Hartman, Chas. H.	"				1					1	10
McGraw, J. C.	Same				1				1		
Macey, Henry	"				1						
Mienerhasan, F.	Frank Koester		1	1				60	1		
Missouri River Coal & Mining Co	Brown & Bower	1		1				60	1		
Lexington Coal & M. Co. land	Morrison Bros				1			46	1		
Napoleon Coal & Mining Co.	Same		1	1				25	1		
O'Malley, Andrew	"		1	1				60	1		
Riley & Kleist	"		1	1				40	1		
Rocky Branch Coal Co	"		1	1				100		1	8
Seawell, J. M. & Co.	Corder Coal Co	1		1							
Smith & Ashbury	Henry Bartels				1			20	1		
Steinman, Henry	Same		1	1							
Steeley & Fowler Coal Co.	"		1		1			100	1		
Summers, M. W.	"				1			100	1		
The Mathews Coal Co.	"		1		1			100	1		
Walton, Thomas	"				1			88	1		
Waverly Coal & Mining Co.	"		1		1			45	1		
Wellington Coal Co.	"				1						
Valentine & Slade	"		1		1						
Y. S. A. Coal Co	"		1		1						
Lexington Coal & Mining Co.	"										
"	McDowell Shaft	1		1				43		1	10
"	Riverton No. 1				1				1		
"	Hackett Mine				1				1		
"	Graddy Mine				1				1		
Totals		8	20	26	6	17			28	5	

LINN

Bottomly, J. C.	Same		1	1				150			
Clark, George	"		1	1				142	1		
Kansas & Texas Coal Co	"	1		1				183		1	10
Landreth & Son	"		1	1				180			
Shaffer, Bernard	"		1	1				155	1		
Thomas, Hannah	Wm. Phipps		1		1						
Totals		1	5	5	1				2	1	

AND VALUE—Continued.

COUNTY.

Mode of working.	Average thickness of vein.	No. of legs powder used during year.	Cost of powder for the year.	Mules.		Employees.			Av. price per ton for mining.		Total number of tons mined.	Average value per ton at mine.	Amount received for the total output of the year.	
				Winter.	Summer.	Miners.	Others.		Total.	Winter.				Summer.
							Winter.	Summer.						
1	1:4			1		2		3			120	\$2 25	\$270 00	
1	1:8					4		5			600	1 60	960 00	
1	1:8					15		15			8,000	1 75	5,260 00	
1	1:8					80		80			8,400	1 75	14,700 00	
1	1:6					40		44			6,000	1 87½	11,200 00	
1	1:6					25		28			561	2 00	1,122 00	
1	1:6					2		4			1,888	1 75	2,341 50	
1	1:7					3		3			640	1 75	1,120 00	
1	1:6					3		3			800	1 75	525 00	
2	1:6					40		43			4,800	1 25	6,000 00	
1	1:6					8		9			920	1 62½	1,498 00	
1	1:5					55		70			14,512	1 90	27,620 61	
1	1:5					50		67			11,600	2 00	23,200 00	
1	1:6					5		6			550	2 00	1,120 00	
1	1:11					2		2			550	2 25	787 50	
1	1:4					6		8			800	1 50	900 00	
1	1:5					18		21			3,600	1 60	6,075 00	
1	1:6					20		22			8,513	1 90	6,674 70	
1	1:8					2		2			80	1 80	144 00	
1	1:8					5		6			720	1 75	1,260 00	
1	1:10					5		7			370	1 87½	700 00	
1	1:10					4		5			430	1 87½	806 25	
1	1:3					2		2			200	2 00	400 00	
1	2					55		60			17,360	1 85	23,486 00	
1	1:8					2		2			80	1 80	144 00	
1	1:6					180		133			23,240	1 75	41,008 75	
1	1:10					80		66			19,000	1 34	26,532 00	
1	1:6					7		7			700	1 87½	1,312 50	
1	1:6					70		84			8,100	1 62½	13,162 50	
1	1:9					8		8			3,015	1 62½	4,600 00	
1	1:6					17		20			3,045	1 51	5,909 40	
1	2:2					6		6			1,088	1 62½	1,764 75	
1	1:6					5		6			457	1 75	800 00	
1	1:6					50		55			8,000	1 50	12,000 00	
1	1:10					25		28			3,225	1 50	4,852 50	
1	1					40		55			25,000	1 60	40,000 00	
1	1:10					4		4			250	1 75	437 50	
1	1:6					70		80			14,000	2 00	2,800 00	
1	2					3		3			280	2 00	560 00	
1	1:5					70		77			10,978	1 75	19,212 50	
1	1:6					10		11			3,400	1 75	5,950 00	
1	8:6	200	\$400 00			22		28			7,000	1 00	7,000 00	
1	1:5					30		33			6,000	1 60	9,600 00	
1	1:4					1		1			0	2 00	120 00	
1	1:5					4		6			10,400	1 62½	16,900 00	
1	1:8					72		87			49,985	1 40	198,373 00	
1	1:8					93		109			53,657	1 40	198,373 00	
1	1:8					3		50			15,743	1 35	15,743 00	
1	1:8					4		52			22,943	1 40	22,943 00	
45	4	200	400 00	30	24	1271	696	133	137	1464	833	871,928	1 48	551,528 96

COUNTY.

1	2:4					8		2		10		1 25		900	2 00	1,800 00
1	2					10		1		11		1 25	1 25	1,700	1 87½	3,187 50
1	2:4					95		16		111		1 00	1 00	43,453	1 63	68,541 46
1	2:4	2	5 00			8		8		9		1 25	1 12½	800	2 00	1,200 00
1	2:2					9		8		8		1 25	1 12½	1,409	1 87½	2,641 85
1	1:10					2		2		2		1 50		240	2 00	480 00
6		2	5 00	3	3	132	107	19	16	151	121			48,302	1 57	75,850 81

CHARACTER, TONNAGE

LIVINGSTON

Name of company.	Operator.	Kind of power		Kind of opening.				Depth of shaft—feet.	Kind of ventilation		Diameter of fan
		Steam	Horse	Shaft.	Slope.	Dirt ...	Strip-pit...		Furnace ...	Fan.	
Cox, W. A.	Same .....	...	1	1	..	..	..	60	...	...	...

MACON

Baldwin, Boon	Yates & Powell	1	..	1	..	1	..	75	..	1	10
Bevier Black Diamond Coal Co.	Same	1	..	1	..	1	..	75	..	1	10
Brennan, Patrick .....	" .....	..	..	..	..	1	..	..	..	..	..
Griffin, John B.	T. P. Hunt .....	..	..	..	..	..	1	..	..	..	..
Havard, William	Same .....	..	..	..	..	..	1	..	..	..	..
Kansas & Texas Coal Co.	Same, Mine No. 26 .....	..	1	..	..	1	..	..	1	..	..
"	" 27 .....	..	1	..	..	1	..	..	1	..	..
"	" 33	1	..	..	1	..	..	..	..	1	12
"	" 43	1	..	1	..	..	..	183	..	1	10
"	" 45	1	..	1	..	..	..	188	..	1	12
"	" 48	1	..	1	..	..	..	28	..	1	10
"	Brock, contractor. ....	..	..	..	..	1	..	..	1	..	..
"	Davis, " .....	..	..	..	..	1	..	..	1	..	..
"	Duncan, " .....	..	1	..	..	1	..	..	1	..	..
"	Ferris, " .....	..	1	..	..	1	..	..	1	..	..
"	Heefner, " .....	..	..	..	..	1	..	..	1	..	..
Little Pittsburg Coal Co.	A. G. French	1	..	1	..	..	..	185	..	1	12
Loomis Coal Co.	Same No 1.	1	..	1	..	..	..	55	..	1	10
Loomis Coal Co.	" 4	1	..	1	..	..	..	60	..	1	12
Phipps, J. B.	Jas Campbell .....	..	..	..	..	1	..	..	..	..	..
Powell, Robt.	Thos. Gunter .....	..	..	..	..	1	..	..	..	..	..
Richmond, J. G.	Same .....	..	..	..	..	1	..	..	..	..	..
Rowland, Peter .....	" .....	..	..	..	..	1	..	..	..	..	..
Smith, George E.	"	1	..	1	..	..	..	40	..	..	..
Summers, A. J. ....	" .....	..	..	..	1	..	..	..	..	..	..
Terrell, Robt. ....	" .....	..	..	..	..	1	..	..	..	..	..
Terrell, Robt.	John Harrold	1	..	1	..	..	..	80	..	1	10
Watson Coal and Mining Co.	Same	1	..	1
Totals	10	4	9	8	15	1	..	7	9	...

MONTGOMERY

Vandalia Coal Co.	Same	1	..	1	103	..	1	8
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NODAWAY

Birch Mine	Corydon Bird	1	1	50
Elsworth & Olds	Same	1	30
Managan, John & Co.	"	1
Martin, Thomas .....	" .....	..	..	1	..	..	..	..	..	..	..
Montgomery, J. W.	F. T. Phillips .....	..	..	1	..	..	..	..	..	..	..
Nicholas Bros.	John Wagstaff	1	..	1	..	..	..	32	..	..	..
Pierson, C.	Same .....	..	..	1	..	..	..	..	..	..	..
Potts, Wm.	T. H. Howard	1	..	1	..	..	..	33	..	..	..
Totals .....	.....	4	..	3	4	..	..	..	..	..	..

AND VALUE—Continued.

COUNTY.

Amount received for the total output of the year.														
Average value per ton at mine														
Total number of tons mined.....														
Av. price per ton for mining.		Summer..												
		Winter..												
Employees.					Mules									
Miners. Others. Total.					Winter.....					Summer.....				
					Summer..					Winter..				
Winter..					Summer..					Winter..				
Summer..					Winter..					Summer..				
Winter..					Summer..					Winter..				
Summer..					Winter..					Summer..				
Winter..					Summer..					Winter..				
Summer..					Winter..					Summer..				
Winter..					Summer..					Winter..				
Summer..					Winter..					Summer..				
Winter..					Summer..					Winter..				
Summer..					Winter..					Summer..				
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Summer..					Winter..					Summer..				
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COUNTY.

1	2			20	15	100	80	20	15	120	95	60	50	150	1 46	219 00
1	4:6					2	2		2	2				60,000	1 10	66,000 00
1	3:6					2								850	1 25	437 50
1	1:8					2		1		8		1 25		228	1 75	399 00
1	1:8					1				1				80	1 50	120 00
1	4	583	993 75	1	1	18	13	10	6	28	19	60	50	12,790	1 24	
1	4	2,362	4,033 50	8	8	56	92	40	60	96	152	60	50	56,693	93	
1	4	4,442	7,778 50	8	7	133	111	102	65	235	176	60	50	106,607	91	
1	4	6,120	10,710 00	14	12	181	175	59	58	240	228	60	50	146,889	1 05	
1	3:6	3,491	6,109 25	9	8	150	135	59	43	209	176	60	50	83,893	1 01	
1	4:3	1,877	3,284 75	3	7	75	61	73	24	153	85	60	50	45,406	94	527,680 75
1	4	850	787 50	2	2	20	15	3	3	23	18	60	50	14,691	1 00	
1	4	600	1,850 00	3	3	35	25	4	4	39	29	60	50	24,731	1 00	
1	4	240	540 00	2	2	10	10			10	10	60	50	10,287	1 00	
1	4	355	798 75	2	2	10	10	4	4	14	14	60	50	15,665	1 00	
1	4	350	897 50	1	1	20	15	2	2	22	17	60	50	14,229	1 00	
1	4	300	500 00	5	4	100	70	12	7	112	77	60	50	34,400	1 00	34,400 00
1	4:6			12	10	100	80	23	20	123	100	60	50	46,516		
1	4:6			18	15	125	100	30	25	155	125	60	50	69,873	1 24	144,400 00
1	4:6	8	14 00			2				2		1 00		260	1 25	825 00
1	2					1		1		2		1 00		65	1 50	97 50
1	5	5	8 75			1				2		1 00		80	1 25	100 00
1	2					2				2		1 00		120	1 25	150 00
1	2					5	4	1	1	6	5	1 12½	1 12½	1,760	1 50	2,744 50
1	4:6					1				1				100	1 75	115 00
1	1:8					5	3			5	2	1 12½	1 12½	800	1 25	1,200 00
1	1:10					5	2			5	2	1 12½	1 12½	800	1 35	1,080 00
1	4:6			8	8	75	60	15	12	90	72	60	50	41,000	1 10	45,100 00
2	25		20,993	37,540	25	116	105	1235	1058	465	344	1700	1402	788,563	1 04+	824,478 26

COUNTY.

1	2:6			2	2	40	30	10	10	50	40	92	92	15,923	1 35	21 496 05
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COUNTY.

1	1:2					10	6			10	6	80	80	800	2 50	2,000 00
1	1:3					2				2		1 00		50	2 50	125 00
1	1					5				5		1 00		458	2 50	1,145 00
1	1:2					1				1		1 00		200	2 50	500 00
1	1									1		1 00		50	2 50	125 00
1	1					2				2		1 00		125	2 75	333 75
1	1:2					2				2		75		65	2 50	162 50
1	1:4					16		1		17		80		800	2 62½	2,096 00
2	6					39	6	1		40	6			2,548	2 54	6,487 25

CHARACTER, TONNAGE

PETTIS:

Name of company.	Operator.	Kind of power.		Kind of opening				Depth of shaft—feet.	Kind of ventilation		Diameter of fan
		Steam	Horiz.	Shaft	Slope	Drift	Strip-pit		Furnace	Fan	
Fisher, R. C.	Thomas Soran						1				
Thatcher, P. A.	Same		1	1				80			
Totals			1	1			1				

PUTNAM

Adkins, William	Same.		1	1				27	1		
Barnhart, A. J.						1					
Blackbird Coal Co.		1		1				58		1	12
Carden, I. H.						1					
Dickerson Bros.						1					
Henkle, R. F.	Elmer Patterson					1					
Jump, Wm.	Same.		1	1				81			
Mendota Coal and Mining Co.		1		1		1		68	1		
Miner, Neal						1					
Pherigo, Martin	Ira Pherigo & Bro.					1					
Sanders, Virginia	P. H. Veach					1					
Totals		2	2	4		8			2	1	12

BALLS

Vandalia Coal Co.	Same		1	1				42	1		
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RANDOLPH

Bond, F. C.	W. H. Roebuck				1						
Breckenridge, John	John Breckenridge	1		1				90		1	10
Breckenridge, John	Same	1		1				85		1	12
Brown & Welsby	Geo. Welsby		1	1				66	1		
Caffery-Baker Coal Co.	Same		1			1			1		
Dean, Harvey					1						
Detienne, A. D.						1			1		
Edwards, Emanuel						1					
Fleming, Thos.		1		1				145		1	12
Givens, Adam	Lawrence Murry					1					
Higbee Coal and Mining Co.	Wm. Walton	1		1				175		1	10
Lowes, John	Rutherford & Co.				1				1		
Mathews, Catharine	O. E. Kimble		1		1						
Milburn, Joseph	J. Milburn & Sons		1	1				50	1		
Miller, W. E.	John Snider					1					
Mitchell, W. E. & Co.	Same	1		1				75		1	10
Moberly Mutual Coal Co.	Perkins Bros.		1	1				100			
Morris, John L.	Same				1				1		
Reese, Sarah D.	Lamb & Bailey		1		1				1		
Renick Coal Co.	Same	1		1				90			
Rutherford, H. L. & Sons						1			1		
Stewart & Robinson						1					
Strieff, M.			1			1				1	
Vaughn, Wm.						1				1	
Ward, Harry			1	1				88			
Ward, Edward					1						
Williams, J. B.			1	1				96	1		
Totals		6	10	11	7	9			13	5	

AND VALUE—Continued.

COUNTY.

Amount received for the total output of the year.....		\$62 00 262 50		\$2 00 1 75		\$2 00 1 79		Total number of tons mined.....		Av. price per ton for mining.		Employees.				Mules		Cost of powder for the year.....	No. of kegs powder used during year..	Average thickness of vein	Mode of working.									
										Summer.		Winter..		Total.		Others					Miners.		Summer.....		Winter.....		Pillar- and-room.....		Long-wall.	
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COUNTY.

1	2:10					8	1			8	1	87%	87%	920	1 25	1,150 00
1	2:10					2	30	6	4	51	34	1 00	80	180	1 25	225 00
1	2:10					2				5		1 00	80	10,400	1 70	17,680 00
1	2:10					2				2		87%		560	1 12½	562 50
1	2:10					2	2			2		75		120	1 25	150 00
1	2:10					2				2		80	70	900	1 25	1,125 00
1	2:10					2				2		75		40	1 25	50 00
1	2:10					18	18	237	197	58	59	88	70	181,770	1 34	176,444 48
1	2:10					2				2		1 00		550	1 25	427 50
1	2:10					2				2		75		138	1 00	138 00
1	2:10					2				5		87%		328	1 25	410 00
1	2:10					15	18	318	230	64	63			145,641	1 36	198,387 48

COUNTY.

1	2:00					12	12	8	8	15	15	1 00	90	2,160	1 45	3,132 00
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COUNTY.

1	3:10	100	225 00			6	8	1		7	8	91	91	1,400	1 25	1,750 00
1	3:10	1000	2000 00			75	50	10	8	85	58	60	50	30,000	85	25,500 00
1	3:10	1400	2800 00			100	75	17	18	117	88	60	50	50,000	85	42,500 00
1	3:10					7		1		8		80		550	1 25	1,062 50
1	3:10	250	500 00			4	60		11		71		50	18,000	1 15	18,400 00
1	3:10	20	39 00			2	1		2	1		80		400	1 25	500 00
1	3:10	20	45 00			1	1	1	1	4	2	80	70	2,000	1 12½	2,250 00
1	3:10	12	27 00			2			2			50		728	1 22	888 16
1	3:10					185		25		160		50		25,904	1 25	32,380 00
1	3:10					8	8	150	120	38	30	90		2,000	1 25	2,500 00
1	3:10					4				4		80	80	64,000	1 30	83,200 00
1	3:10					4				4		70		720	1 25	900 00
1	3:10					4				4		80		480	1 25	600 00
1	3:10	10	28 00			3	3			3	3	87%	87%	800	1 50	1,200 00
1	3:10					3				3		87%		450	1 25	562 50
1	3:10					1	8		8	11		70		508	1 12½	569 25
1	3:10	100	225 00			12	5	3	2	15	7	85	80	5,322	1 87	7,262 50
1	3:10	20	50 00			4	2	1		5	2	80	80	1,200	1 12½	1,350 00
1	3:10	48	115 00			1	6	5	1	1	7	80	70	3,500	1 25	4,375 00
1	3:10	40	80 00			1	17	8	4	8	21	65	80	4,000	1 25	5,000 00
1	3:10					1	1	7	1	1	18	8	60	4,166	1 20	4,999 20
1	3:10	85	70 00			4	2	1	1	5	3	80	70	1,280	1 15	1,472 00
1	3:10					1	3	1	1	4	2	80	70	340	1 25	425 00
1	3:10					3				3		88		80	1 25	100 00
1	3:10	90	180 00			7	3	1	1	8	4	85	71	2,438	1 87½	3,849 50
1	3:10	4	10 00			1		1		2		80		200	1 25	250 00
1	3:10	68	157 50			2		2		4		80		1,000	1 87½	1,875 00
2	25		3232	6501 50		27	24	577	354	109	76	686	430	219,762	1 1181	245,720 61

CHARACTER, TONNAGE

RAY

Name of company.	Operator.	Kind of power.		Kind of opening.				Depth of shaft—feet.	Kind of ventilation.		Diameter of fan.
		Steam	Horse	Shaft	Slope	Drift	Strip-pit		Furnace	Fan	
Black Diamond Coal Co.	Wm Pence & Bro		1	1				80	1		
Bissell Coal Co	Same	1		1				64	1		
Bovard-Brown Coal Co		1		1				45	1		
Campbell, Margaret	Jas M. Edgar					1		85			
Darneal Coal Co	Same		1	1				110	1		
Evans, L. D.	S. A. Neville			1				85			
Hartwell, Arnold & Co	J. W. Turner				1				1		
Hubbell Mining Co	Same	1		1				112	1		
Hubbell, Hyatt & Hubbell		1		1				115	1		
Huston, Joseph						1					
Kansas & Texas Coal Co		1		1				80		1	12
Mosby's Mine	Rooney Bros		1	1				60	1		
Murray & James	Jas. Harding		1	1				60	1		
Pickering Coal Co	Jos. Pickering	1		1				107	1		
Rankin, A. F.	Same				1				1		
Reynolds Mine	J. T. Pierce		1	1				90	1		
Richmond Coal Co	Same, Camden Mines	1		1				60			
"	"	2		1				60	1		
"	" Richmond M	3		1				65			
"	"	1		1				70			
"	"	1		1				75			
"	Same, Richmond	5	1	4				110	1	1	12
Sater, Henry W	Same		1	1				156	1		
Starr, Alexander	Wm. Phillips					1					
Williams, R. J.	Same		1	1				95	1		
Totals		11	9	20	2	3			16	2	

SALINE

Arrow Rock Cannel Coal Co	F. Alexander					1					
Briggs, Isaac	R. Thompson					1					
Cortell, R. M.	J. N. McQuinlan	1	1					50			
Dickinson, Thos. & Sons	Same				1						
Durnill, Peter	Wm. Durnill					1					
Hedger, Wm	Same					1					
Marmaduke, V	I. V. Swaringer	1	1					60	1		
Totals		2	2	1	3	1			1		

SCHUYLER

James, W. F	Same	1			1						
Mock, A & Bro					1						
Totals		1			2						

SULLIVAN

Milan Land & Coal Mining Co	Same	1		1				200			
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AND VALUE—Continued.

COUNTY.

Mode of working.	Average thickness of vein	No. of legs powder used during year	Cost of powder for the year	Mules.		Employees						Av price per ton for mining.		Total number of tons mined	Average value per ton at mine	Amount received for the total output of the year
				Winter	Summer	Miners		Others		Total		Winter	Summer			
						Winter	Summer	Winter	Summer							
1	2			1	1	12	4	8	1	15	5	1.00	1.00	2,000	\$1.75	\$3,500.00
1	2					35	10	6	3	41	13	1.00	1.00	7,120	1.75	12,460.00
1	2					50	15	5	2	55	17	1.00	1.00	10,000	1.62½	16,250.00
1	1:8					5				5		1.25		220	2.00	440.00
1	2:4			1		40		4		44		1.00		15,000	1.50	22,500.00
1	1:4					2				2		1.25		150	2.00	300.00
1	1:10					15		5		20		1.00		600	2.00	1,200.00
1	2:6			2		65		25		90		1.00		14,000	1.50	21,000.00
1	2:6			3	2	80	50	20	12	100	62	1.00	1.00	20,000	1.50	30,000.00
1	2:6					3				3		1.37½		399	2.00	798.00
1	1:9			6	5	99	76	24	22	123	98	1.00	1.00	38,790	1.54	59,874.00
1	2					10	3			10	3	1.00	1.00	2,948	1.75	4,160.00
1	1:10					8	2	1		9	2	1.00	1.00	1,200	1.75	2,100.00
1	1:10					55	30	14	7	69	37	1.00	1.00	18,201	1.55	28,232.00
1	1:6			3	1	40	50	6	3	46	23	1.00	1.00	7,720	1.50	11,580.00
1	2					2				2		1.00	1.00	200	2.00	400.00
1	1:10			4	4	100	80	18	14	118	94	1.00	1.00	48,351	1.50	72,526.50
1	1:10															
1	1:8															
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1	1:6															
25				30	23	908	510	175	97	1083	607	319,405	1.52	486,231.08

COUNTY.

.....	1	1:8	1	2	3	1	25	65	2 50	162 50	
.....	1	1:6	.....	.....	.....	1	1	1	1	00	.....	160	1 60	256 00
.....	1	2	.....	.....	.....	2	.....	2	.....	25	.....	190	2 50	500 00
.....	1	1:6	.....	.....	.....	1	.....	1	.....	25	.....	160	2 50	400 00
.....	1	1:8	.....	.....	.....	1	.....	1	.....	25	.....	100	2 50	250 00
.....	1	1:6	.....	.....	.....	1	.....	1	.....	25	.....	60	2 50	150 00
.....	1	1:10	8	4	4	2	12	6	1 18	1,200	2 08½	2,500 00
.....	1	5	15	5	6	2	21	7	1,865	2 15	4,018 50

COUNTY.

1	3:10			1	5	1	6	87½	562	1.25	702.50
1	3:8			1	8		8	1.00	400	1.25	500.00
2				1	8	1	9		862	1.25	1,202.50

COUNTY.

1	3:6	80	\$160.00		4	3	3	3	7	6	80	70	1,000	1.75	1,750.00
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CHARACTER, TONNAGE

ST. CLAIR

Name of company.	Operator.	Kind of power.		Kind of opening.				Depth of shaft—feet.	Kind of ventilation.		Diameter of feet.....
		Steam.....	Horiz.....	Shaft.....	Slope.....	Drift.....	Strip-pit.....		Furnace.....	Fan.....	
Alexander, J. W.....	Same.....				1		1				
Allison, R. W.....	".....				1						
Batchelor Bros.....	".....						1				
Browning, W. G.....	".....				1						
Donahue, Daniel.....	Ed. McDaniel.....						1				
Douthat & Vannice.....	".....				1						
Merryfield, O. S.....	".....				1						
Reed Mine.....	Jos. Allison.....						1				
Seymour, W. A.....	Same.....				1	1					
Johnson Mine.....	Wm. Watkins.....				1						
Totals.....					5	1	4				

VERNON

Allen, L.....	E. Greene.....						1				
Allen & Williams.....	Same.....						1				
Arthur Coal and Mining Co.....	".....	1				1			1		
Bedford Coal and Mining Co.....	".....										
Brown, J. S.....	A. O. Finley.....	1	1					65	1		
Burks, C. M.....	J. Flake.....						1				
Burton, W. C.....	J. C. Lucas.....						1				
Central Coal and Coke Co.....	Same.....	1	1					185	1		10
Central Coal and Coke Co.....	".....	1	1					140	1		14
Crawford, C. B.....	".....						1				
Ferry, M. F. & B. E.....	".....						1				
Frank, A. H.....	Leased in lots.....						1				
Gill, J. F.....	Same.....						1				
Gonterman, W. G.....	Doyle & Shepard.....	1		1							
Hall Bros.....	Clay Campbell.....						1				
Hightower, J. H.....	Same.....						1				
Huselson, G. W.....	".....	1		1					1		
Jones, P. W.....	J. M. Devore & Co.....	1	1					85	1		
Kingsaid, John.....	Jno DeCoursey.....						1				
Larkin, W. E.....	Same.....						1				
Moore, John.....	Myers & Whitworth.....						1				
Mosher, Henry G.....	Same.....					1					
Neal, Sampson.....	".....	1	1					20			
Nelson, Dr. E. L.....	W. Gardner.....						1				
Potter, John.....	Medlin Bros.....						1				
Prewitt, W. H.....	Same.....						1				
Rich Hill Coal and Mining Co.....	".....	1		1				188	1		10
Rich Hill Coal and Mining Co.....	".....	1	1						1		15
Robinson, Dr. W. D.....	Cooper & Son.....	1	1					40	1		
Smith, Peter.....	Same.....						1				
Vernon Coal and Mining Co.....	".....	1		1			1		1		12
Williams, Frank & Co.....	".....		1			1	1		1		
Totals.....		5	8	7	4	8	18		6	5	

AND VALUE—Continued.

COUNTY.

Mode of working.	Pillar-and-room.	Long-wall.	Average thickness of vein.	No. of kegs powder used during year.	Cost of powder for the year.	Mules.		Employees.			Av. price per ton for mining.		Total number of tons mined.	Average value per ton at mine.	Amount received for the total output of year.	
						Summer.	Winter.	Miners.	Others.		Total.	Winter.				Summer.
									Winter.	Summer.						
1	1	1	1 1/4	3	\$4 50			2			2	1 00		\$1 50	\$300 00	
1	1	1	3 3/4	1				2			2	1 00	1 00	312	1 50	468 00
1	1	1	1 1/4	1				3			3	1 25		180	2 00	360 00
1	1	1	1 1/4	1				1			1	1 25		200	2 00	400 00
1	1	1	3 3/4	4				20	9	3	3	1 25		125	1 50	187 50
1	1	1	3 3/4	3				3			23	80		4,000	1 50	6,000 00
1	1	1	3 3/4	3				3			3	86		320	1 50	480 00
1	1	1	2 5/8	2				4	3		4	1 00	1 00	450	2 20	978 00
1	1	1	2 5/8	2				4	3		4	1 00	1 00	450	2 20	978 00
1	1	1	2 5/8	2				2			2	1 25		200	2 00	400 00
6	6	6		2	4 50	2	2	38	14	9	3	47	17	6,517	1 56	10,171 50

COUNTY.

3					4			4	3			520	1 50	780 00
8:6			14 00				3	3	3			944	1 25	1,182 00
1	5	70	140 00	2	20		10		30		60	2,680	1 20	3,086 00
1	3:4	200	400 00		7				9		55	2,400	1 50	3,600 00
2					2				2			520	2 00	1,040 00
1:2					2				4			275	1 50	425 00
1	4	1500	3 375 00	3	35	35	15	15	50	50	50	37,251	1 00	37,251 00
1	4	7500	16,875 00	15	135	135	30	30	165	165	50	151,764	1 00	151,764 00
1	2	5	11 25		3				3			400	1 75	700 00
3:6					3		2		5			800	1 75	1,400 00
1:4												896	1 25	1,120 00
1:6	5	12 00			2				6			280	1 25	350 00
1	2:4			1	4				4	1 00		168	1 50	252 00
1	1:6				1				1			100	1 75	175 00
1	1				1				1			80	1 75	140 00
1	4	164	328 00	3	16		8		24	50		3,798	1 12½	4,272 75
1	2:4	208	428 40		8	4	4	2	12	6	80	1,600	1 87½	2,200 00
1					3				3			120	1 50	180 00
1	1				1	1			1	1		185	1 25	231 25
1	1:6				1				1			60	1 25	75 00
1	2				1	1			1	1 25	1 25	150	1 75	262 50
1	2			1	3				3	1 10		225	1 50	337 50
1	2:2				2				2			160	1 75	280 00
1	2:6				1				1			70	1 75	122 50
1	1:2				2				2			130	1 75	227 50
1	3:9	536	1,206 00	4	44	44	15	15	59	59	50	8,016	1 10	8,817 60
1	3:9	85	191 25		22				22			1,866	1 10	1,491 60
1	3			1	10	3	1		11	3	62½	1,500	1 12½	1,687 50
1	1:7				2				2			120	1 50	180 00
1	4:6	50	112 50	1	4				4		50	1,000	95	950 00
1	4:8	420	756 00	2	12		12	10	24	10	60	16,908	1 20	20,292 32
14		10,751	23,849 40	28	28	315	265	86	93	401	358	284,376	1 04	244,883 02

Comparison of
or decrease
product.

1889

ase.

425

4

Name of company.	Operator.	Kind of power	
		Steam.	Horse.
Alexander, J. W.	Same		
Allison, R. W.	"		
Batchelor Bros.	"		
Browning, W. G.	"		
Donahue, Daniel	Ed. McDaniel		
Douthat & Vannice	"		
Merryfield, O. S.	"		
Reed Mine	Jos. Allison		
Seymour, W. A.	Same		
Johnson Mine	Wm. Watkins		
Totals			

Allen, L.	E. Greene		
Allen & Williams	Same		
Arthur Coal and Mining Co.	"		1
Bedford Coal and Mining Co.	"		
Brown, J. S.	A. O. Finley		1
Burks, C. M.	J. Flake		
Burton, W. C.	J. C. Lucas		
Central Coal and Coke Co.	Same	1	
Central Coal and Coke Co.	"	1	
Crawford, C. B.	"		
Ferry, M. F. & B. E.	"		
Frank, A. H.	Leased in lots		
Gill, J. F.	Same		
Gonterman, W. G.	Doyle & Shepard		1
Hall Bros.	Clay Campbell		
Hightower, J. H.	Same		
Huselson, G. W.	"		1
Jones, P. W.	J. M. Devore & Co		1
Kincaid, John	Jno DeCoursey		
Larkin, W. E.	Same		
Moore, John	Myers & Whitworth		
Mosher, Henry G.	Same		
Neal, Sampson	"		1
Nelson, Dr. E. L.	W. Gardner		
Potter, John	Medlin Bros		
Frewitt, W. H.	Same		
Rich Hill Coal and Mining Co.	"	1	
Rich Hill Coal and Mining Co.	"	1	
Robinson, Dr. W. D.	Cooper & Son		1
Smith, Peter	Same		
Vernon Coal and Mining Co.	"	1	
Williams, Frank & Co	"		1
Totals		5	8

TO 1893.

8, also percentage of increase
e in price received per ton for

of base.	Av. price per ton.		Difference.
	1889.	1893.	
....	\$1 70	\$1 49	21
...	2 03	1 47	56
00	1 25	1 20	5
14	1 03	1 11	8
....	1 50	1 49	1
....	2 09	1 99	10
....	1 55	1 53	2
....	.....	2 33	....
....	.....	1 46	....
....	.....	1 92	....
....	.....	1 50	....
....	.....	1 35	....
..	1 60	1 99	39
....	1 70	1 50	20

TABLE VI—SHOWING COAL OUTPUT BY COUNTIES

In their order of production, with price per ton, and total amount received the same; also number of mines employing 10 or more men and the employing less than 10 men.

Comparison
or decrease
product.

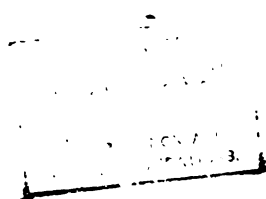
Counties.	Tons of coal mined for year ending June 30, 1893.....	Average price re- ceived per ton....	Am't received for the product of the year.....	Employing more than 10 men.....	Tons 1889	
					Increase.	
					4,425	
					19,964	
Macon	788,563	\$1 04	\$824,478 26	16		
Bates.....	627,514	1 11	700,562 56	15		
Lafayette.....	371,928	1 48	551,528 96	27		
Ray	319,405	1 52	486,231 08	14	15,658	
Vernon.....	234,376	1 04	244,883 02	7		
Randolph.....	219,762	1 11	245,720 61	7	2,946	
Putnam.....	145,641	1 36	198,557 43	2		
Henry.....	125,962	1 47	185,643 77	10	11,328	
Barton	61,301	1 20	73,863 70	3		
Linn	48,302	1 57	75,850 81	3	1,088	
Audrain	42,262	1 47	62,085 65	5		
Grundy.....	35,770	2 06	73,328 50	2	890	
Caldwell.....	29,020	1 99	57,749 75	3		
Boone.....	25,602	1 49	38,365 50	3	1,13	
Callaway.....	23,961	1 53	36,769 50	4		
Adair.....	20,957	1 49	31,247 25	3	7,13	
Montgomery.....	15,923	1 35	21,496 05	1		
Johnson.....	12,101	1 59	19,228 75	2	1,2	
Clay.....	7,139	1 50	10,398 77	1		
Dade.....	6,695	1 50	10,042 50	3	1,8	
St. Clair.....	6,517	1 56	10,171 50	1		
Jackson.....	4,819	2 00	9,638 00	1	4,4	
Cooper.....	2,892	1 99	5,721 50	.....	
Nodaway.....	2,548	2 54	6,487 25	2		
Ralls.....	2,160	1 45	3,132 00	1		
Saline.....	1,865	2 15	4,018 50	.....	
Cole.....	1,200	1 35	1,620 00	.....	
Charlton.....	1,136	1 92	2,190 00	.....	
Carroll.....	1,088	2 33	2,544 00	.....	
Livingston.....	1,000	1 75	1,750 00	.....	
Sullivan.....	1,000	1 75	1,750 00	.....	
Schuyler.....	962	1 25	1,202 50	.....	
Cedar.....	890	1 46	1,299 00	.....	
Pettis.....	181	1 79	324 50	.....	
Totals	3,180,442	1 253	3,999,681 17	136		

Table VII gives the increase or decrease in amount of coal mined by the counties producing coal, from the year 1889 to 1893 inclusive embracing a period of five years. The product is shown for each year for each county, with the average price received per ton at the mine and the aggregate amount for which the same was sold. The table also furnishes a comparison indicating the increase or decrease of production for each county between the years 1889 and 1893, with the percentage of such increase or decrease shown, together with the dif-

E PAST FIVE YEARS, 1889 TO 1893.

Comparison of output for past 5 years, also percentage of increase or decrease of same, and difference in price received per ton for product.

Tons 1889 to 1893.		Percentage of		Av. price per ton.		Difference.
Increase.	Decrease.	Increase.	Decrease.	1889.	1893.	
4,425	27	.....	\$1 70	\$1 49	21
19,964	90	.....	2 03	1 47	56
.....	61,363	.....	100	1 25	1 20	5
.....	102,119	.....	14	1 03	1 11	8
15,658	158	.....	1 50	1 49	1
2,946	11	.....	2 09	1 99	10
11,328	90	.....	1 55	1 53	2
1,088	100	.....	.....	2 33	....
890	100	.....	.....	1 46	....
1,136	100	.....	.....	1 92	....
7,139	100	.....	.....	1 50	....
1,200	100	.....	.....	1 35	....
1,865	181	.....	1 60	1 99	39
4,405	195	.....	1 70	1 50	20



ference in prices received per ton of coal at the respective periods named. From the table we also find that the total coal produced for year ending June 30, 1893, amounted to 3,190,442 tons, while the output for year 1889 was 2,222,981 tons, showing an increase for 1893 of 967,461 tons over 1889, or 43½%. The average price received per ton of coal in 1889 was \$1.318, while the price per ton in 1893 averaged \$1.253, from which it will be observed that a decrease in the average price per ton has resulted, and that the present price of coal is 6½ cents per ton less than it was five years ago. A decrease in the amount of tonnage will be noticed in only four out of thirty-four counties producing coal, while the percentage of increase may be seen to run from 11% to 1660%. Vernon county leads in the percentage of increased production, while Macon county shows the largest increase of tonnage.

ACCIDENTS IN COAL MINES.

As long as mines are operated, so long will they bring forth their annual crop of accidents. Innumerable acts may be passed by our Legislature for the protection of the miner, but the casualties of the mines will not decrease until the miner himself uses more precaution in guarding against accidents. For the year ending June 30, 1893, the total number of accidents have been 47. As compared with the previous year the showing is very gratifying, there being 23 per cent less accidents, with 173,157 tons more coal mined. Of the 47 accidents 21 were fatal and 26 non-fatal.

From the evidence taken before coroner, and from personal examinations by this department, and a summing up of the most reliable information that could be obtained, the accompanying table will show results as follows:

That 27 of the accidents resulted from negligence on the part of the unfortunate victims, 15 are classed as accidental, 2 from unwarned lowering of cages, 1 from gas, 1 from unsafe machinery and 1 unavoidable accident.

While there are recorded 15 less accidents for this year, compared with the year preceding, yet the average of fatal to non-fatal is largely in excess.

The total number of tons of coal mined for each life lost is found to be 151,926 tons, as against 147,223 tons the previous year. The average number of tons of coal mined for each non-fatal accident was 122,709, as against 73,592 tons the preceding year.

Falls of roof and coal continue in this State, as in all other states of the Union, to be the most disastrous feature in the mining of coal. The accidents with us from this cause prove to be larger than that of all other causes combined.

In looking over the list of accidents and examining the same, it will be noticed that there has been great carelessness on the part of many of the miners in not propping their rooms in due time, thus running the risk of being crippled, and even losing their lives, by working under loose and unsafe rock. As soon as a miner takes charge of a room he is responsible for his own safety; he should examine his roof often through the day and secure it with props in proper time. There are many men working in the mines of this State incapable of provid-

ing for their own safety, owing to their lack of skill and experience, and accidents thus occur through ignorance of their real danger.

It is noticeable that more accidents happen where the room-and-pillar system of mining is practiced than where the long-wall plan is used, and more especially where the coal is blasted off the solid, as in the use of powder props are knocked out and the roof shattered to such an extent that it takes the skill and ability of the most experienced miner to keep his room safe and well secured with timber.

Of the 47 accidents occurring during the past year, Bates county is credited with 21, of which 15 were non-fatal and 6 fatal; while Macon county is charged with 8 fatal accidents. It should be remembered, however, that while there are many more accidents in these two counties than in any other two counties of the State, yet Macon and Bates counties produced 44 per cent of the entire amount of the coal mined. From this may also be seen the extra fatality associated with mines operated under the pillar-and-room plan over that of the long-wall system.

The above mentioned 44 per cent of coal mined shows a total of 29 accidents, 15 of which were non-fatal and 14 fatal, while the remainder, or 56 per cent of the output, cost 18 accidents, of which only 7 were fatal and 11 non-fatal.

AUDRAIN COUNTY.

Thomas Morgan, a miner working at the Vandalia Fire-Brick Co.'s Mine, was killed by a fall of coal. He was recognized by his employers as the most experienced miner in the shaft. From the examination of the sons of the deceased, coroner deemed inquest unnecessary, as they testified that the roof was good; that there was plenty of time for escape, and that their father warned them to get out of the way, as the coal was coming. The deceased left a wife and seven children.

Frank Vire, a miner employed at the mine of Omer Detienne & Bro., was badly injured by a fall of coal. His head was cut, collar-bone broken and breast injured.

BATES COUNTY.

W. K. Allen, a miner working at the mines of the Rich Hill Coal Co., was killed while removing his tools from a finished room to a new working place. It appears that the deceased placed his tools in a pit-car and hitched same on to a trip, getting in the car and sitting on top of his tool-bex, and while thus riding, his head struck the roof so violently as to cause paralysis of the lower extremities. The deceased

made a statement before he died exonerating the company from all blame. He was 58 years of age, and left a wife and one child.

F. L. Cash, employed as a miner at Mine 15, Rich Hill Coal Co., was killed by a fall of roof. From the statements made concerning the accident, we find that F. L. Cash and John Shields were working together in a room, and because of negligence in the proper timbering of the same a portion of the roof fell, killing Cash and slightly injuring Shields. The following is the verdict of W. H. Allen, coroner :

State of Missouri, }
County of Bates. } ss.

The coroner having duly sworn and affirmed ——— of Bates county, Missouri, diligently to inquire and true presentment make, in what manner and by whom F. L. Cash, whose dead body was found at Mine No. 15, Bates county, Mo., on the 20th day of February, 1893, came to his death, after hearing the evidence, and upon full inquiry concerning the facts and careful examination of said body, do find that the deceased came to his death from injuries received from slate falling from the roof of his room upon him, owing to the fact that said room was not propped, and that he had been notified to prop the same, and props furnished him by the Rich Hill Coal Mining Co.

Given under my hand at Rich Hill, in the county aforesaid, this 21st day of February, 1893. W. H. ALLEN, Coroner.

August Dechamps, a miner working at Mine No. 13, Rich Hill Coal & Mining Co., was killed by a blast, Oct. 27, 1892. The coroner's verdict was—"carelessness on part of the employe." We further learned that the deceased had lighted his shots, and did not wait a sufficient length of time for the squib to do its work before returning to examine the same. The indications were that he had just reached his room when the shot went off, throwing him some 60 feet, and killing him instantly. He was 38 years of age, and had a wife and 3 children.

W. E. Garrison, miner working at Mine No. 2, of the Rich Hill Coal & Mining Co., was instantly killed by a blast, Sept. 7, 1892.

This department caused a personal examination to be made of the accident.

It was learned that the deceased and his "butty," John Irwin, were working in the same room. Mr. Irwin informed us that they had prepared two shots, and finding they were out of squibs, they borrowed two, placing one in each needle-hole, and in the rush and hurry they lighted the squib in the first hole, and neglected to remove the one placed in the second hole. The oversight he thinks due to the fact, that the fire-boss had been hurrying them, and in the meantime they had forgotten the second squib. They lighted the squib in the first hole, and went out and waited for the shot to fire; when it did fire, they returned to fire the other shot, and it was while they were approaching with this object in view, that the second shot went off.

Evidently the first shot set fire to the squib in the second. Almost the entire top of Garrison's head was torn off, and he was otherwise mangled. Irwin sustained a compound fracture of the right leg between the knee and ankle, while the left leg was so badly torn that it had to be amputated just below the knee.

The coroner's declaration was as follows: "That deceased came to his death from a mining shot accidentally fired in his room."

Louis Sise, miner, 30 years of age, working at the mines of the Rich Hill Coal and Mining Co., was killed March 28. The deceased, it is supposed, was in the act of needling out a shot-hole, with the squib remaining in the same. The coroner's verdict was as follows: "That Louis Sise came to his death by needling out his hole after having been squibbed."

Frank DeBolt, coal miner, employed at the mines of the Rich Hill Coal and Mining Co., was seriously injured June 27, 1893, from a fall of roof, as to occasion his death a short time after the accident. The deceased was unmarried, and 21 years of age. From information most reliable concerning the accident, it appears that the deceased left his room to go into that of another party to assist in putting a pit-car on the track; that in their efforts to get car on track, a prop was knocked down, causing the roof to fall on deceased.

LAFAYETTE COUNTY.

C. Anderson and Henry Asher, miners, employed at the mine of the Francisco Coal Co., were killed Sept. 3, 1892, by an explosion of gas. From a personal examination made by this department it was learned that the tip-house of the above named company burned down, together with some of the timbering in the shaft, Aug. 28.

On the evening of Sept. 3, C. Anderson, H. Asher and J. F. Delaney were down the shaft, engaged in retimbering at a distance of 80 feet from the bottom. Mr. Anderson, who was an old and experienced miner, and at the time was acting as mining boss in the absence of the regular boss, for some unaccountable reason, considering his experience, struck a match to light his pipe, he being at the time some 20 feet from the surface, with the other two men mentioned. The mine having been idle some days, gas had accumulated, and when the match was struck, of course an explosion resulted. The three men on the platform were all knocked off by the concussion. Delaney caught one of the timbers and held to it until hoisted out; he was severely burned but otherwise uninjured. The other two men fell to the bottom, a distance of 80 feet, receiving such injuries as resulted in death to each on the following day.

Mr. Anderson left a wife and 8 children. Mr. Asher was a single man.

Andrew Francisco, superintendent of the Francisco Coal Co., was killed by an explosion of gas, July 12, 1892.

From an examination made by the former Inspector of Mines as to the cause of the accident, and the testimony of four witnesses, the following information in substance was obtained:

The deceased and Henry Chrisman went down the shaft to make measurement of amount of steam-pipe necessary to make connection between two pumps. Almost immediately after reaching bottom of shaft, an explosion occurred, killing Mr. Francisco and slightly injuring Mr. Chrisman, who probably escaped by being knocked in the water.

In the testimony of A. S. Twineham, a miner employed at the Francisco, we find that he testified that several months prior to the explosion, the State Mine Inspector visited the mine, and that after an examination, he heard the Inspector instruct Mr. H. C. Francisco to purchase a safety-lamp and give it to his pit-boss, with instructions to examine the mine every morning before the men were permitted to go to work; that the mine was making gas. Contrary to the well-known fact that the mine was making gas, the superintendent enters the mine with an open lamp, accompanied by a man who knew nothing of mines or mining, with just such result as the situation gave promise of.

MACON COUNTY.

John Formento, a miner working at Mine No. 27, Kansas & Texas Coal Co., was killed by a fall of rock at the face of his room, July 1, 1892. He was 36 years of age; had a wife and one child.

Following is the testimony taken before the coroner's jury, and the verdict of the jury:

MACON, Mo, July 1, 1892.

The following is a copy of the proceedings of an inquest held on the body of John Formento, who was killed in the mines of the Kansas & Texas Coal Co., at Ardmore, Macon county, Missouri, by John A. Dale, coroner of Macon county, Mo.

Giovanni Formento, of lawful age, being duly sworn, on his oath says: I am a coal miner.

Q. What part of Mine No. 27 were you working at time of accident?

A. I was about two feet off the face; the rock seemed to be solid in the rough.

Q. Was there sufficient props on hand for use if you had thought there was use for them?

A. Yes.

(Signed)

GIOVANNI FORMENTO.

Wm. Bradley, of lawful age, being sworn, says :

I am a coal miner. A boy came into my room and said there was a man under a rock. I went around into the room where he was killed. I went to work and assisted in getting him to the top ; he was dead. The body was that of John Formento, a coal digger.

(Signed)

WM. BRADLEY.

The above is correct.

(Signed)

JOHN A. DALE, coroner,
Macon county, Mo.

INQUISITION.

STATE OF MISSOURI, } ss.
County of Macon. }

An inquisition taken at Ardmore, in county of Macon, on 1st day of July, 1892, before me, John A. Dale, coroner of the county aforesaid, upon the view of the body of John Formento, then and there lying dead ; good and lawful men, householders of the township of Chariton, in the county aforesaid, who, being sworn, and charged diligently to inquire and true presentment make, how and in what manner and by whom said John Formento came to his death, upon their oaths do say :

We, the jury, find from the evidence in the case of inquest held on the body of John Formento to be, that he came to his death by the fall of a rock, which was supposed to be safe at the time they entered their room.

In witness whereof, as well as the aforesaid coroner as the jurors aforesaid, have to this inquisition put their names, at the place and on the day and year aforesaid.

(Signed)

JOHN A. DALE, Coroner.

ISAAC T. RICE,

ALBERT KINDER,

D. A. TUMLIN,

JO. HARDISTER,

JAMES EALY,

VICTOR VANDERBECK.

Carl Gray, a mule driver at Mine No. 46, Kansas & Texas Coal Co., was killed May 23, 1893, by being run over by a pit-car. Deceased was 20 years of age and a single man. The following is a copy of the verdict of the coroner's jury :

INQUISITION.

STATE OF MISSOURI, } ss.
County of Macon. }

An inquisition taken at Bevier, in county of Macon, on the 23d day of May, 1893, before me, John A. Dale, coroner of the county aforesaid, upon the view of the body of Carl Gray, then and there lying dead on the entry, and came to his death by falling off the tail chain and the car run upon him. Good and lawful men, householders of the township of Bevier, in the county aforesaid, who, being sworn and charged diligently to inquire and true presentment make, how and in what manner and by whom the said Carl Gray came to his death, upon their oaths say.

In witness whereof, as well the aforesaid coroner as the jurors aforesaid, have to this inquisition put their names, at the place and on the day given aforesaid.

(Signed)

JOHN A. DALE, Coroner.
THEO. SCHILL,
THOS. RAMSAY,
MARK VICKERS,
C. E. RICE,
LEWIS HUGHES,
WM. SUMMERS.

James F. Green, a miner working at Mine No. 27, Kansas & Texas Coal Co., was instantly killed by a fall of rock August 16, 1892. Deceased was 50 years of age; had a wife and 3 children.

The coroner returned the following verdict:

We, the jury, find that James F. Green came to his death by an unavoidable accident.

(Signed)

JAMES M. FERGUSON, Foreman.
JAMES L. DUNCAN,
MARION CALVERTON,
H. M. HARDISTER,
WM. ERWIN,
JAMES GIVENS.

From information gathered from the testimony given before the coroner's jury, it appears that deceased and his "butty" were engaged in taking a skip off main entry pillar at cross-cut (which had been gobbed). A shot had been fired, the roof examined and nothing discovered to cause alarm, and if props had been needed the space would not permit of their use. The coal was removed and deceased at time of accident was shoveling, when the rock fell without warning. It was one of those unfortunate accidents for which neither the charge of carelessness or blame can be attached to either employer or employe.

James Harvey Jenkins, occupation a miner, and employed by the Kansas and Texas Coal Co., was killed April 19, 1893, by a fall of rock. Deceased was 22 years of age, married, but had no children.

The information received concerning the accident states that at time of its occurring Mr. Jenkins was engaged in shoveling coal away, preparatory to setting props, when a fall of rock at the face of the workings caught him. The rock was 5 feet long, 4½ feet wide, and run in thickness from 8 inches to a feather-edge. It is stated that the face of room was immediately examined, and found to be very unsafe, as a result of neglect to properly timber the same. As the company furnishes every facility for the prompt and proper timbering of rooms, it appears to us that the accident was caused by careless timbering on part of deceased.

E. C. Johns, a miner employed at the mine of the Watson Coal and Mining Co., was killed February 24, 1893, by a fall of rock at the face of his room. He was 50 years of age, and had a wife and six children.

The following is a copy of the verdict of the coroner's jury:

INQUISITION.

STATE OF MISSOURI, }
County of Macon. } ss.

An inquisition taken at Bevier, in county of Macon, on the 24th day of February, 1893, before me, John A. Dale, coroner aforesaid of the county aforesaid, upon the view of the body of C. E. Johns, then and there lying dead, Wm. Green, David Aitken, John Sandles, W. C. Collett, J. C. Williams, Peter Owens, good and lawful men, householders of the township of Bevier, in the county aforesaid, who, being sworn and charged diligently to inquire and true presentment make, how and in what manner and by whom the said C. E. Johns came to his death, upon their oaths do say: "That the deceased came to his death by accident or negligence on his own part."

From the testimony before the coroner's jury by witnesses, some of whom had been miners for 40 years, it is shown that the deceased, at the time the accident occurred, was working in a room with his son, who was 19 years of age. It further appears that a shot had been fired, and that the father and son had been loading coal into mine cars, and having finished the same, the deceased was engaged in placing his post-drill to make another shot, when a large rock—called a bell-rock by some and by others a pot-roll rock—fell, entirely covering him. The rock was 18 inches thick, 4 feet wide and 10 feet long. The evidence shows that by the exercise of a little prudence the accident might have been avoided, as sufficient props were in the room at the time to prop this stone and keep it up. Witnesses testified to an experience with similar material which had been held up by the proper use of props.

Andrew Vinyard, Richard Vinyard, Obe Taylor, all three colored men, and employed as miners, were killed Oct. 14, 1892, at Mine No. 46, Kansas & Texas Coal Co., by a fall of rock. Andrew Vinyard was 53 years of age; had wife but no children. Richard Vinyard was 20 years of age, and an adopted son of Andrew Vinyard. Obe Taylor was 17 years of age.

The verdict of the coroner's jury was that the accident was due to the carelessness of the deceased. Mr. Woodson, former Inspector, filed in the office of the State Mine Inspector a memorandum in connection with the papers relating to this accident, which states that he had made a personal examination of the mine, and the room in which the accident had occurred, and found that in the testimony before the coroner's jury, the coroner had made a thorough examination of

witnesses known to be familiar with the accident, and for that reason did not take any further evidence. From a summing up of all the evidence, it appears that three men (deceased) were at work together in one room, when a large fall of slate extending nearly the entire width of the room occurred, with the result as stated. It further appears that the unfortunate men had neglected to timber their room, though repeatedly warned, and even threatened with discharge by mine officers.

PETTIS COUNTY.

George Brown, Stonewall Jackson (both colored men), miners working at Bronaugh coal mine, were killed January 4, 1893. Accident was result of insufficient timbering on part of Jackson, deceased, although he had been warned and directed to make his place secure. It appears that Jackson's foot was caught by falling slate, and that Brown, in attempting to release Jackson, knocked down a prop, which caused a large piece of slate to fall upon both, with result as above.

TABLE VIII—SHOWING ACCIDENTS IN COAL MINES, BY COUNTIES, FOR THE YEAR ENDING JUNE 30, 1893.

AUDRAIN COUNTY.

Name of employer.	Name of employee.	Occupation.	Am't of insurance.						Nature of accident.	Coroner's verdict.
			Age.	Single.	Married.	No. of children.	Non-fatal.	Fatal.		
Vandalla Fire Brick Co.	Morgan, Thomas.	Coal miner.	48	1	1	7	1	1	Fall of coal while mining.	Examined sons of deceased, but held no inquest.
Omer Detienne's Mine.	Vire, Frank.	"	37	1	1	1	1	1	"	"
Totals.				1	1	7	1	1		

BATES COUNTY.

Name of employer.	Name of employee.	Occupation.	Am't of insurance.						Nature of accident.	Coroner's verdict.
			Age.	Single.	Married.	No. of children.	Non-fatal.	Fatal.		
Rich Hill Coal and M. Co.	Allen, W. K.	Coal miner.	58	1	1	1	1	1	Caught between pit-car and roof.	Exonerated company.
"	Boas, James.	Driver.	91	1	1	1	1	1	Foot squeezed between pit cars.	"
"	Boyer, Grant.	Coal miner.	25	1	1	1	1	1	Hands and face burned; disfigured in part.	"
"	Boyer, W.	"	19	1	1	1	1	1	"	"
"	Boyer, W.	"	30	1	1	1	1	1	"	"
"	Debolt, Frank.	"	91	1	1	1	1	1	Fall of roof in face of room.	Neglect of deceased.
"	Deshaies, August.	"	32	1	1	1	1	1	Fall of roof.	No inquest.
"	Dunlap, Wm. A.	Dumper.	44	1	1	1	1	1	Right leg broken; caught by pit-car.	Carelessness of deceased.
"	Farnham, Wm. E.	Coal miner.	35	1	1	1	1	1	Fall of roof.	"
"	Garrish, Wm. E.	Driver.	38	1	1	1	1	1	Mining shot accidentally fired.	Accidental.
"	Gerrish, May John.	"	16	1	1	1	1	1	Kicked in face by a mule.	"
"	Grayson, John.	Coal miner.	26	1	1	1	1	1	Fall of roof of slate.	"
"	Grayson, John.	Trapper.	14	1	1	1	1	1	Caught between cage and curbing.	"
"	Hawthorn, John.	Machine runner.	38	1	1	1	1	1	Fall of roof.	"
"	Irwine, John W.	Coal miner.	41	1	1	1	1	1	Shot accidentally fired; leg amputated.	"
Simcoe Jay's mine.	Kent, John.	"	97	1	1	1	1	1	Burned by shot blowing through pillar.	"
J. M. Wias & Co.'s mine.	Leard, Thomas.	Laborer.	40	1	1	1	1	1	Waste box jumped back and struck bottom.	"
Rich Hill Coal and M. Co.	McMurry, O.	Coal miner.	19	1	1	1	1	1	Fall of coal undermining shot.	"
"	Marple, M.	Laborer.	30	1	1	1	1	1	Arm struck side of shaft and was broken.	"
"	Seas, Louis.	Coal miner.	40	1	1	1	1	1	Needle shot after being squibbed.	Verdict accordingly.
Rich Hill Coal Co.	Vaughn, N. E.	"	40	1	1	1	1	1	Fall of roof; carelessness on his part.	"
Totals.				2	2	8	5	6		

ACCIDENTS IN COAL MINES—Continued.

Name of employer.	Name of employee.	Occupation.	Am't of insurance.				Nature of accident.	Coroner's verdict.
			Was the injured party insured.	Yes	No			
			Fatal					
			Non-fatal					
			No. of children					
			Married					
			Single					
			Age					
HENRY COUNTY.								
Bogart & Thompson	Pitcher, Charles	Coal miner	32	1			Mine shot; leg broken	
Blair Diamond Mine	Hoopengartner, Nick	"	39	1			Fall of roof; had foot amputated	
Totals				2				
JOHNSON COUNTY.								
Thos. H. Boyd's Mine	Blackburn, Chas	Cager	18	1			Cage lowered to bottom without warning	
LAFAYETTE COUNTY.								
Henry Macey's Mine	Ackerman, M.	Coal miner	20	1			Fall of roof	
Francisco Coal Co	Anderson, C	Act'g m. boss	38	1			Mine explosion	
Henry Macey's Mine	Asher, Henry	Miner	23	1			Fall of coal	
Francisco Coal Co	Boyd, Thos	"	30	1			Fall of roof	
Lexington Coal & Mining Co	Caray, Henry	"	20	1			Mine explosion	
Henry Macey's Mine	Dolaney, J. F	Supt. of mine	24	1			Explosion of fire-damp	
	Francisco, Andrew	Miner	55	1			Fall of coal	
	Morris, George	"	15	1			Fall of coal; leg broken	
	Taylor, George	"	35	1				
Totals				12	6	8		

MACON COUNTY.

Mine	Name	Occupation	Age	Sex	Marital	Value of property	Cause of death
Kansas & Texas Coal Co.	Forrento, John	Coal miner	28	1	1		Fall of roof.
"	Gray, Carlo	Mule driver	20	1	1		Supposed to have been run over by mine car
"	Green, James F	Coal miner	50	1	1	\$2,000	Fall of roof.
"	Jenkins, J H	"	22	1	1		"
Watson Coal Co	Johns, C E	"	50	1	6		"
Kansas & Texas Coal Co.	Taylor, Obe	"	17	1	1		"
"	Vinyard, Andrew	"	33	1	1		"
"	Vinyard, Richard	"	20	1	1		"
Totals			8	5	10	8	

PETTIS COUNTY.

Mine	Name	Occupation	Age	Sex	Marital	Value of property	Cause of death
Bronaugh Coal Co	Brown, George	Coal miner			1		Fall of roof.
"	Jackson, Stonewall	"			1		"
Totals					2		

RANDOLPH COUNTY.

Mine	Name	Occupation	Age	Sex	Marital	Value of property	Cause of death
John Breckinridge Mine	McKinnon, John	Coal miner	26	1	1		Fall of roof.
H. R. Briabess Mine	Shanahan, John	"	38	1	7	\$500	Hooks detached from traces and permitted bucket in which deceased was being lowered to fall to bottom of shaft
Totals				1	7	1	

Accident caused by use of unsafe tackle.

TABLE IX—RECAPITULATION OF COAL MINE ACCIDENTS.

Number of non-fatal accidents.....	26
Number of fatal accidents.....	21
Total number of accidents.....	47
Number of single men fatally injured.....	6
Number of married men fatally injured.....	15
Total number fatally injured.....	21
Number of wives made widows.....	13
Number of children made fatherless.....	43
Number of men injured carrying insurance.....	2
Amount of insurance carried, \$2500.	
CAUSE OF ACCIDENTS AND NUMBER OF MEN INJURED BY EACH.	
From falls of roof.....	18
From falls of coal.....	7
From mine shots, premature and otherwise.....	6
From mine cars.....	5
From explosions.....	3
From gas.....	3
From cages.....	3
From unsafe machinery.....	1
From kick of a mule.....	1
Total.....	47
HOW THE INJURED MEN WERE EMPLOYED.	
Mine-bosses.....	2
Miners.....	36
Machine runner.....	1
Cager.....	1
Drivers.....	3
Dumper.....	1
Laborers.....	2
Trapper.....	1
Total.....	47

LIST OF PROPRIETORS AND OPERATORS.

ADAIR COUNTY.

Proprietor.	Operator.	Postoffice address.
Besanko's Mine	Louberger & McCabe.....	Kirksville.....
Ford, A.	A. Ford	Stahl
Ledford, Jacob	Jacob Ledford.....	"
McCahan, H. C.....	H. C. McCahan.....	Kirksville.....
Pennsylvania Coal Co.....	H. C. McCahan.....	"
Scott, D. C.....	D. C. Scott	"
Stanley, S. H.....	S. H. Stanley.....	Greencastle.....

AUDERAIN COUNTY.

Audrain Mfg. Co.....	C. Dixon.....	Vandalia.....
Detienne, O. J.	O. J. Detienne	Mt. Carmel.....
Eastham, C. P.....	C. P. Eastham.....	Laddonia.....
McGuire, Martha.....	Sam'l McGuire.....	Martinsburg.....
Martinsburg Coal Co.....	Martinsburg Coal Co.....	"
Sherman, Bethel & Smith.....	Sherman, Bethel & Smith..	Farber
Silvers, L.....	P. A. Redifer.....	Centralia.....
Turpin, C.....	C. Turpin	Laddonia.....
Vandalia Coal Co.....	Vandalia Coal Co.....	Vandalia.....

BARTON COUNTY.

Bacon, W. S.....	W. S. Bacon.....	Lamar
Betz Bros.	Betz Bros	Liberal.....
Boulware Bros.....	Lavery Bros	"
Cameron, C. J.....	C. J. Cameron	Lamar.....
Campbell, John	John Campbell	Iantha.....
Clark, Wilson.....	H. Beeker.....	Lamar.....
Clark, W. C.....	W. C. Clark	"
Cole, M.....	M. Cole	"
Gilkey, E.....	P. Helm.....	Pedro.....
Hanshaw's Mine	Hefton & Brown.....	Liberal
Kimball, Daniel.....	Dan'l Kimball.....	Lamar.....
Lanyon, S. H.....	S. H. Lanyon.....	Pittsburg, Kas....
Liberal Coal Co.....	Liberal Coal Co	Liberal.....
Parry, Mrs. W.....	G. W. Glaze	Lamar.....
Rising's Bank	B. D. Franklin.....	Iantha.....
Ryan, G. G.....	G. G. Ryan.....	Milford
Spear, M. M.....	M. M. Spear.....	Lamar
Sturdevant Mine.....	G. E. Misner.....	"
The Wear Coal Co.....	The Wear Coal Co.....	Pittsburg, Kas....
Titus & Newton.....	Titus & Newton.....	Liberal.....
Waite, C. G.....	Wm. Snyder	Minden
Whitsell, H. J.....	H. J. Whitsell.....	Liberal.....

BATES COUNTY.

Proprietor.	Operator.	Postoffice address.
Baldwin, L.	L. Baldwin	Worland
Blue Lick Coal Co	Blue Lick Coal Co	Amoret
Bruce, Wallace	Wallace Bruce	Rich Hill
Caton, Chas	Charles Caton	Worland
Chambers heirs	Harris Bros	"
Cooper, Benjamin	Benjamin Cooper	Amsterdam
Darby & Jennings	T. Khart	Foster
Deering & Johnson	Deering & Johnson	Hume
Enterman & Bear	Enterman & Bear	Worland
Ford, John A	John A. Ford	Rockville
Hopkins, S. W	S. W. Hopkins	Rich Hill
Johnson, J. H	J. H. Johnson	Worland
Lewis, O. H	Gardner & Miller	"
McGailley & Brown	Vance & McNally	Amoret
Manchester, Thos. & Son	Thos. Manchester & Son	Worland
March, John J	John J. March	Reavley
Martin Gee Coal Co	Martin Gee Coal Co	Rich Hill
Miller, Dennis	Dennis Miller	Amoret
Newkirk, J. A	J. A. Newkirk	Worland
Pearson, Peter	Peter Pearson	Rich Hill
Peeler, D. D	D. D. Peeler	Rockville
Raney, F. A. & Co	F. A. Raney & Co	Worland
Rankin Bros	Rankin Bros	"
Rich Hill Coal & Mining Co	Rich Hill Coal & M. Co	Rich Hill
Seawell, J. M. & Co	J. M. Seawell & Co	Kansas City
Skillman, A	A. Skillman	Foster
Spencer, O	O. Spencer	Rich Hill
Sullivan, W	W. Sullivan	"
Thompson Coal Co	Thompson Coal Co	Amoret
Thurman, E. H	E. H. Thurman	Hume
Vaughn, N. R	N. R. Vaughn	Worland
Walker Mine	J. C. Morgan	"
Wise, J. M	J. M. Wise	Rich Hill
Wise Bros	Wise Bros	"

BOONE COUNTY.

Centralia Coal Co	Centralia Coal Co	Centralia
Columbia Coal Co	A. Rees	Columbia
Dougherty, Geo. W	Chas. O'Donnell	Henry station
Davis, Isaac R	Isaac R. Davis	Brown's station
Edwards, J. P	H. Oldham	Centralia
Gaither, James W	James W. Gaither	Brown's station
Goodding, W. A. & Co	W. A. Goodding & Co	Columbia
Gossett, John F	John F. Gossett	Switzler station
Head, James	M. C. Petro	Columbia
Jones, Walter	Walter Jones	Brown's station
Kimbrell, H. S	H. S. Kimbrell	Columbia
Mayer & Bro., D. A	Wald, Andrew & Co	Sturgeon
Rogers, George	George Rogers	Brown's station
Rouse, John M	J. M. Rouse	Columbia
Stidham, W. A	W. A. Stidham	Harrisburg
Stone, James W	James W. Stone	Perche
Winterholter, John	Mathew Faight	Brown's station

CALDWELL COUNTY.

Proprietor.	Operator.	Postoffice address.
Caldwell Coal Co.....	Caldwell Coal Co.....	Hamilton
Cowgill Mining Co	Reavis & Switzler	Cowgill
Hamilton Coal Co.....	Hamilton Coal Co	Hamilton
Kingston Coal Co	Kingston Coal Co.....	Kingston.....

CALLAWAY COUNTY.

Castle, William	Wm. Castle.....	Fulton
Crews & Thurmond.....	A. Harris.....	"
Criswell, A. W.	Robt. Henderson	Guthrie.....
Fulton Fire Brick Co.....	Fulton Fire Brick Co.....	Fulton
Henderson, J. S.	Renfrew & White	McCredie
Harris, John.....	John Harris	Fulton.....
Smith, James.....	John Marsenkoff.....	"
Smith, James.....	James Smith	"

CARROLL COUNTY.

Farr, Ralph.....	Ralph Farr.....	Little Compton
Jenkins, David.....	David Jenkins.....	Carrollton.....
Mayview Mine	Henry Smith	"
Wallace, Presley.....	Wallace & Harvey.....	"

CEDAR COUNTY.

Proprietor.	Operator.	Postoffice address.
Ashenfelter, F. G.....	D. Long and A. Herman ..	Jerico
Davis, A. B.	A. B. Davis	"
Duncan, J. C	J. C. Duncan	"
Pickett, E. D.....	W. B. Packard	"
Poage, G. M.	G. M. Poage.....	" Springs.....
Stratton, D. G.....	J. S. Cole	"

CHARITON COUNTY.

Calison, J. M.....	M. B. Prather.	Salisbury
Faller, Joseph.....	Joseph Faller.....	Indian Grove.....
Huenten, John.....	R. Brewer.....	Guthridge Mills.....
Isle, R. W.	R. W. Isle	Indian Grove.....
Williams, C. M.....	C. M. Williams.....	Marceline, Linn Co.

CLAY COUNTY.

Proprietor.	Operator.	Postoffice address.
North Kansas City Coal & M. Co.	N. Kansas City C. & M. Co.	Kansas City.....

COLE COUNTY.

Leach, Geo. H. & Co.....	Geo. H. Leach & Co.....	Elston.....
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COOPER COUNTY.

Hazell, Chas. W.....	Chas. W. Hazell.....	Boonville.....
Jenkins, H. W.....	H. W. Jenkins.....	".....
Missouri Valley Coal and M. Co..	Missouri Valley C. & M. Co.	".....
Palmberg, A.....	A. Palmberg.....	Bunceton.....
Smith & Lesley.....	Smith & Lesley.....	Boonville.....

DADE COUNTY.

Clayton, W. R.....	W. R. Clayton.....	Sylvania.....
Gardner & Carson.....	F. A. Jones.....	".....
McArthur, T.....	T. A. Jones.....	".....
McCluey, Rob't.....	Rob't McCluey.....	".....
McCome's Mine.....	R. M. Sharp.....	".....
McGarvey's Mine.....	Eli Zook.....	".....
McGarvey, Sam'l, Estate.....	James Henson.....	".....
Seaton, J. R.....	O. P. Ramsey.....	".....
Shoemaker, J. K.....	Wm. Shoemaker.....	Cedarville.....

GRUNDY COUNTY.

Grundy County Coal Co.....	Grundy County Coal Co...	Trenton.....
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HENRY COUNTY.

Proprietor.	Operator.	Postoffice address.
Ballinger, Samuel.....	D. W. Huey.....	Brownington.....
Barth, J.....	S. B. Price.....	Lucas.....
Beedy, J. C.....	W. E. Hughes.....	Windsor.....
Blair Diamond.....	John Thompson & Co.....	Brownington.....
Brown Coal Co.....	Ed. Brown & Co.....	Deepwater.....
Calhoun Coal Co.....	Calhoun Coal Co.....	Calhoun.....
Central Coal and Coke Co.....	Central Coal and Coke Co..	Kansas City.....
Clarey, A. W.....	Isaac Trippey.....	Lucas.....
Co-operative Coal Co.....	Co-operative Coal Co.....	Lewis Station.....
Dunlap Coal Co.....	Dunlap Coal Co.....	Brownington.....
England, William.....	Wm. England.....	Clinton.....
Evans, C. W.....	C. W. Evans.....	Lewis Station.....
Gebart, Thomas.....	Thomas Gebart.....	Clinton.....
Gibbs, Henry.....	Henry Gibbs.....	Montrose.....
Gilkin Mines.....	Bogart & Thompson.....	Clinton.....
Herd, John.....	G. W. Boyles.....	Garland.....
Herring & Hess.....	J. S. Harrison.....	Clinton.....
Hurst, John.....	John Hurst.....	Deepwater.....
Hurst, J. W.....	J. W. Hurst.....	".....
Long, John.....	J. W. Clinton.....	Lucas.....
McCloud, Mrs.....	Mrs. McCloud.....	Clinton.....
McFadden, H. B. & Co.....	H. B. McFadden & Co.....	Deepwater.....
Man, James D.....	James D. Man.....	Montrose.....
Miller, W. J.....	W. L. Beaman.....	Windsor.....
Owen, B. L.....	B. L. Owen.....	Clinton.....
Parks, Mrs.....	Wm. Boyce.....	Calhoun.....
Phillips, R. S.....	Douglas & Hosack.....	Lowry City, St. Clair
Pigg, D. H. Coal and Mining Co..	D. B. Pigg Coal & M. Co..	Lewis Station.....
Rivers, W. G.....	K. C. Southern Coal Co....	Independence, Jackson.
Rusk, William.....	Wm. Rusk.....	Deepwater.....
Stewart, W. H.....	W. H. Stewart.....	Lucas.....
Tebo Coal Co.....	R. Bowen.....	Lewis Station.....
Tyree, Joseph.....	Joseph Tyree.....	Montrose.....
Victor, S. M.....	J. H. Keller.....	".....

JACKSON COUNTY.

Kansas City Clay and Coal Co....	K. C. Clay and Coal Co....	Kansas City.....
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JOHNSON COUNTY.

Biezer's Mine.....	E. H. Queener.....	Warrensburg.....
Boyd, Thos. & Sons.....	Thos. Boyd & Sons.....	Knob Noster.....
Boyd, Thos. H.....	P. D. Fitch.....	Montserrat.....
Bullock, P. H.....	P. H. Bullock.....	Warrensburg.....
Harris, J. C.....	J. C. Harris.....	Montserrat.....
Herrington, L. M. & Co.....	L. M. Herrington & Co.....	Warrensburg.....
Melley, M. B.....	M. B. Melley.....	".....
Murley, Joseph.....	Joseph Murley.....	Montserrat.....
Murry, Madison.....	Madison Murry.....	Warrensburg.....
Lanners, Henry.....	Henry Lanners.....	".....
Ronemous, W. L.....	W. L. Ronemous.....	".....
Sack, T. H.....	J. J. Harding.....	Montserrat.....
Staley, M. R.....	M. R. Staley.....	Warrensburg.....
Strickland, Geo. W.....	G. W. Strickland.....	Dunksburg.....
Wood, Benjamin F.....	Benjamin F. Wood.....	Warrensburg.....

LAFAYETTE COUNTY.

Proprietor.	Operator.	Postoffice address.
Armstrong, Joseph.....	Harry St. Clair.....	Greenton
Bell, W. H.	W. H. Bell.....	Corder.....
Bell & Greer	W. H. Greer.....	Lexington.....
Bonanza Coal Co	Bonanza Coal Co.	Kansas City
Bruce & Knoble.....	J. O. Bruce.....	"
Carter, Andrew	Andrew Carter.....	Wellington
Clark, Thomas	Kelly Coal Co.....	Lexington.....
Coleman, Frank	Frank Coleman.....	Higginsville
DeBolt, J. H.	J. H. DeBolt.....	Corder.....
Dover Coal Co	Dover Coal Co.....	Lexington.....
Duncan, Chas. E.	Chas. E. Duncan.....	Higginsville
Excelsior Coal and Coke Co	Excelsior Coal and Coke Co.	"
Farmers' Coal and Mining Co	Beatty, Jones & Campbell.	"
Fox, N. F.	N. F. Fox.....	Dover
Franke, John.....	John Franke.....	Concordia
Francisco, H. C.	C. O. Godfrey.....	St. Louis
Hartman, Charles	Chas. Hartman.....	Kansas City
Haygood Coal Co.....	Gunn & Co.....	Higginsville
Hawkins & Smith.....	J. E. Wilkes.....	"
Hendrick, S. B.	J. P. Kendrick.....	Concordia
Hollowell, Michael.....	Michael Hollowell.....	Lexington.....
Keist, Joseph	Louis Keist.....	"
Kreese, A. F.	A. F. Kreese.....	Concordia.....
Krentz, Fred., Jr.....	Arthur Garrett.....	Wellington.....
Lafayette Coal Co	Lafayette Coal Co.....	Lexington.....
McGrew, J. C.	J. C. McGrew.....	"
Macey, Henry.....	Henry Macey.....	Kansas City
Mienerhagen, F.....	Frank Koester.....	Higginsville
Missouri River Coal & Mining Co.	Brown & Bower.....	Kansas City
Lexington Coal & Mining Co. land	Morrison Bros.....	Lexington.....
Lexington Coal & Mining Co.....	Lexington Coal & M. Co.	St. Louis
Napoleon Coal & Mining Co.....	Napoleon Coal & M. Co....	Napoleon
O'Malley, Andrew.....	Andrew O'Malley.....	Lexington.....
Radd, W.	W. Radd.....	Concordia
Riely & Keist	Riely & Keist.....	Lexington.....
Rocky Branch Coal Co.....	Rocky Branch Coal Co....	Higginsville
Seawell, J. M. & Co	J. M. Seawell & Co.....	Kansas City
Schulte, John.....	Robt. Krampf.....	Concordia
Smith & Asbury.....	Corder Coal Co.....	Corder.....
Steinman, Henry	Henry Bartels	Concordia
Stealey & Fowler Coal Co.....	Stealey & Fowler Coal Co.	Higginsville
Summers, M. W.	M. W. Summers.....	Alma
The Mathews Coal Co	The Mathews Coal Co.....	Mayview
Walton, Thomas	Thomas Walton.....	Lexington.....
Waverly Coal & Mining Co.....	Waverly Coal & M. Co.....	Waverly.....
Wellington Coal Co	Wellington Coal Co.....	Wellington
Valentine & Slade.....	Valentine & Slade.....	"
Y. S. A. Coal Co	Y. S. A. Coal Co.....	Higginsville.....

LINN COUNTY.

Bottomly, J. C.....	J. C. Bottomly.....	Brookfield
Clark, George	George Clark.....	"
Kansas & Texas Coal Co	Kansas & Texas Coal Co....	Marcelline.....
Landreth & Son	Landreth & Son	"
Schaeffer, Bernard.....	Bernard Schaeffer	Brookfield
Thomas, Mrs. Hannah.....	Wm. Phipps.....	Meadville

LIVINGSTON COUNTY.

Proprietor.	Operator.	Postoffice address.
Cox, W. A.....	W. A. Cox	Chillicothe.....

MACON COUNTY.

Baldwin, Boon.....	Yates & Powell.....	New Cambria.....
Bevier Black Diamond Coal Co...	Bevier Black Diam'd C. Co.	Bevier.....
Brennan, Patrick.....	Patrick Brennan.....	Macon City.....
Griffin, John B.....	T. P. Hunt.....	".....
Havard, William.....	William Havard.....	New Cambria.....
Kansas & Texas Coal Co.....	Kansas & Texas Coal Co...	St. Louis.....
Little Pittsburg Coal Co.....	A. G. French.....	Lingo.....
Loomis Coal Co.....	Loomis Coal Co.....	Bevier.....
Phipps, J. R.....	James Campbell.....	College Mound.....
Powell, Robert.....	Thomas Gunter.....	New Cambria.....
Richmond, J. G.....	J. G. Richmond.....	College Mound.....
Rowland, Peter.....	Peter Rowland.....	Macon City.....
Smith, George E.....	George E. Smith.....	".....
Summers, A. J.....	A. J. Summers.....	".....
Terrell, Robert.....	Robert Terrell.....	".....
Terrell, Robert.....	John Harrold.....	".....
Watson Coal & Mining Co.....	Watson Coal & M. Co.....	Bevier.....

MONTGOMERY COUNTY.

Vandalla Coal Co.....	Vandalla Coal Co.....	Wellsville
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NODAWAY COUNTY.

Birch Mine.....	Corydon Bird.....	Quitman.....
Elsworth & Olds.....	Elsworth & Olds.....	".....
Manargan & Co., John.....	John Manargan & Co.....	".....
Martin, Thomas.....	Thomas Martin.....	".....
Montgomery, J. W.....	F. T. Phillips.....	".....
Nicholas Bros.....	John Wagstaff.....	".....
Pierson, C.....	C. Pierson.....	".....
Potts, Wm.....	T. H. Howard.....	Burlington Junct'n.

PETTIS COUNTY.

Fisher, R. C.....	Thomas Scran.....	Dunksburg.....
Thatcher, F. A.....	F. A. Thatcher.....	Green Ridge.....

ACCIDENTS IN COAL MINES—Continued.

Name of employer.	Name of employe.	Occupation.	Am't of insurance.					Nature of accident.	Coroner's verdict.
			Was the injured party insured.	Yes	No.	Fatal.	Non-fatal.		
			No. of children.			Married.	Single.		
			Age.						
HENRY COUNTY.									
Bogart & Thompson	Pitcher, Charles	Coal miner	32	1	1	1	1	Mine shot; leg broken	
Blair Diamond Mine	Hoopengartner, Nick	"	59	1	1	1	1	Fall of roof; had foot amputated	
Totals				2	2				
JOHNSON COUNTY.									
Thos. H. Boyd's Mine	Blackburn, Chas.	Cager	18	1	1	1	1	Cage lowered to bottom without warning..	
LAFAYETTE COUNTY.									
Henry Macey's Mine	Ackerman, M.	Coal miner	20	1	1	1	1	Fall of roof	
Francisco Coal Co.	Anderson, C.	Act'g m. boss	38	1	1	1	1	Mine explosion	
"	Asher, Henry	Miner	23	1	1	1	1	Fall of coal	
Henry Macey's Mine	Boyd, Thos.	"	30	1	1	1	1	Fall of roof	
"	Carey, Henry	"	20	1	1	1	1	Mine explosion	
Francisco Coal Co.	DeLaney, J. F.	Supt. of mine	24	1	1	1	1	Explosion of fire-damp	
"	Francisco, Andrew	Miner	53	1	1	1	1	Fall of coal	
Lexington Coal & Mining Co	Morris, George	"	15	1	1	1	1	Fall of coal; leg broken	
Henry Macey's Mine	Taylor, George	"	35	1	1	1	1		
Totals			1	21	6	8			

MACON COUNTY.

Kansas & Texas Coal Co.	Forrento, John	Coal miner	38	1	1	1	1	Fall of roof	Accidental
"	Gray, Carlo	Mule driver	20	1	1	1	1	Supposed to have been run over by mine car	
"	Green, James F	Coal miner	20	1	3	1	1	Fall of roof	Unavoidable accident
"	Jenkins, J. H.	"	22	1	1	1	1	"	No inquest
Watson Coal Co	Johns, O. E.	"	20	1	6	1	1	"	Negligence of deceased
Kansas & Texas Coal Co.	Taylor, Obe	"	17	1	1	1	1	"	Carelessness on part of dec.
"	Vinyard, Andrew	"	33	1	1	1	1	"	"
"	Vinyard, Richard	"	20	1	1	1	1	"	"
Totals			8	5	10	8	8		

PETTIS COUNTY.

Bronaugh Coal Co	Brown, George	Coal miner				1		Fall of roof	
"	Jackson, Stonewall	"				1		"	
Totals						2			

RANDOLPH COUNTY.

John Breckinridge Mine	McKinnon, John	Coal miner	26	1	1	1		Fall of roof	Accident caused by use of
H. E. Brisbees Mine	Shanahan, John	"	36	1	7	1	\$600	Hooks detached from traces and permitted bucket in which deceased was being lowered to fall to bottom of shaft	unsafe tackle
Totals				1	7	1			

ST. CLAIR COUNTY.

Proprietor.	Operator.	Postoffice address.
Alexander, J. W.....	J. W. Alexander.....	Appleton City.....
Allison, R. W.....	R. W. Allison.....	Taborville.....
Batchelor Bros.....	Batchelor Bros.....	Appleton City.....
Browning, W. G.....	W. G. Browning.....	Lowry City.....
Donahue, Daniel.....	Edward McDaniel.....	Appleton City.....
Douthat & Vannice.....	Douthat & Vannice.....	Vista.....
Merryfield, O. S.....	O. S. Merryfield.....	Johnson City.....
Reed Mine.....	Joseph Allison.....	".....
Seymore, W. A.....	W. A. Seymore.....	Osceola.....
Johnson Mine.....	Wm. Watkins.....	".....

VERNON COUNTY.

Allen, L.....	E. Green.....	Bellamy.....
Allen & Williams.....	Allen & Williams.....	Rich Hill.....
Arthur Coal & Mining Co.....	Arthur Coal & Mining Co.....	".....
Bedford Coal & Mining Co.....	Bedford Coal & Mining Co.....	".....
Brown, J. S.....	A. O. Finley.....	Ketterman.....
Burks, C. M.....	J. Flaks.....	Walker.....
Burton, W. C.....	J. C. Lucas.....	Bronaugh.....
Central Coal & Coke Co.....	Central Coal & Coke Co.....	Kansas City.....
Crawford, C. B.....	C. B. Crawford.....	Walker.....
Ferry, M. F. & B. E.....	F. M. & B. E. Ferry.....	Milo.....
Frank, A. H.....	Leased in 200 foot lots.....	Moundville.....
Gill, J. F.....	J. F. Gill.....	".....
Gonterman, W. G.....	Doyle & Shepard.....	Sheldon.....
Hall Bros.....	Clay Campbell.....	Walker.....
Hightower, J. H.....	J. H. Hightower.....	".....
Huselton, G. W.....	G. W. Huselton.....	Carbon Centre.....
Jones, P. W.....	J. M. Devore.....	Moundville.....
Kincaid, John.....	John DeCoursey.....	Ketterman.....
Larkin, W. E.....	W. E. Larkin.....	Bronaugh.....
Moore, John.....	Myers & Whitworth.....	Moundville.....
Mosher, Henry G.....	Henry G. Mosher.....	Schell City.....
Neal, Sampson.....	Sampson Neal.....	".....
Nelson, Dr. E. L.....	W. Gardner.....	Walker.....
Potter, John.....	Medlin Bros.....	".....
Prewitt, W. H.....	W. H. Prewitt.....	".....
Rich Hill Coal & Mining Co.....	Rich Hill Coal & Mining Co.....	Rich Hill.....
Robinson, Dr. W. D.....	Cooper & Son.....	Moundville.....
Smith, Peter.....	Peter Smith.....	Bronaugh.....
Vernon Coal & Mining Co.....	Vernon Coal & Mining Co.....	Rich Hill.....
Williams & Co., Frank.....	Frank Williams & Co.....	".....

GLOSSARY

OF MINING TERMS USED IN MISSOURI.

After-damp—The mixture of gases remaining in a mine after an explosion of fire-damp.

Air—The current of atmospheric air circulating through and ventilating the workings of a mine.

Air-shaft—A shaft used expressly for ventilation.

Air-stack—A ventilating chimney.

Air-way—Any passage in a mine through which air for ventilating purposes is passed.

Anemometer—An instrument used for measuring the velocity of a ventilating current.

Bearing in—Undermining.

Black damp—Carbonic acid gas CO_2 . It will not support combustion or life.

Blower—A strong discharge of gas from a fissure.

Blown-out shot—A shot that has blown out the tamping without bringing down the coal.

Bonnet—A shield or covering over a cage to protect it and the miners from anything falling down the shaft.

Bottom—The landing at the bottom of the shaft or slope; the floor, bottom rock or stratum underlying a coal seam.

Brattice—A division or partition in a shaft, slope, heading, gangway or other underground working places for providing ventilation.

Brattice-cloth—A heavy cloth or canvas, often covered with water-proof material, used in the construction of doors and brattices instead of plank.

Bridle-chains—Short chains by which the rope is attached to the cage.

Buntons—Timbers placed horizontally across a shaft to carry the cage guides, also to strengthen the shaft timbers.

Butty—A partner in a contract for driving or mining; comrade, crony.

Cage—A platform on which the mine cars are raised and lowered in mine.

Car—mine-car—Any car used for the conveyance of coal or mineral in a mine.

Cap—A piece of plank used on the top of a prop.

Cartridge—Paper or water-proof cylindrical cases filled with gun-powder, forming the charge for blasting.

Catches, latches or keeps—Catches or rests, to hold the cage when it is brought to rest at the top, bottom or any intermediate landing; also, stops fitted on a cage to prevent cars from running off.

Cave-in—A caving-in of the surface over mine workings.

C. H₄—The chemical symbol for fire-damp.

Charge—The amount of powder or other explosive used in one blast, or shot.

Choke-damp—(See black damp).

Chute (also spelled **Shute**)—Any passage through which the coal descends by gravity.

Clanney lamp—A safety-lamp invented by Dr. Clanney.

Clod—A layer of soft shale or slate, forming a very bad roof over a seam of coal.

Coal measures—The carboniferous formation.

Colliery—The whole plant, including the mine and all adjuncts.

Column pipe—The pipe through which the water is conveyed from the mine pumps to the surface.

Creep, or squeeze—The gradual upheaval of the floor of a mine, due to the weight of the overlying strata.

Crib—A structure composed of horizontal frames of timber laid upon one another, or a frame-work built like a log cabin.

Cribbing—Timbering a shaft with crib-work, commonly extending from surface to the bottom.

Cropping out—Coming to the surface; out-cropping.

Cross-cut—A small passage-way driven at right angles to the main heading or entry to connect it with a parallel gangway or air-course.

Davy lamp—A safety-lamp invented by Sir Humphrey Davy.

Dead-work—Work which at the time it is done and of itself produces little or no profit.

Digging—Mining operations in coal or other mines.

Dip—To slope downward from the surface; the inclination of a stratum of a coal seam.

Ditch—The drainage gutter.

Doors—Wooden doors fixed in underground roads to prevent the ventilating current from taking a short cut to the up-cast air-way.

Down-cast—The opening through which the fresh air is drawn or forced into the mine—the in-take.

Drift—A water-level gangway or entry driven into the seam from the surface.

Drum—The revolving cylinder around which the winding rope is coiled.

Safety catches—Appliances fitted to cages to make them *safety cages*.

Seam—(1) A bed of coal. (2) A fissure or joint, either empty or filled with foreign matter.

Shaft—A vertical pit or hole made through strata, through which the product of the mine is brought to the surface, and through which the ventilation is passed either into or out of the mine.

Sheave—A wheel with a grooved circumference, over which a rope is turned, either for the transmission of power or for winding or hauling.

Shot—(1) A blast. (2) The firing of a blast. (3) Injured by a blast.

Shot-lighter or Shot-firer—A man specially appointed by the manager of the mine to fire off shots.

Sink—To excavate, to bore or put down a bore-hole.

Siphon—A simple, very effective and economical mode of conveying water in a mine over a hill. It takes the form of an iron pipe, bent like an inverted U; the vertical height between the water and top of hill must not exceed 28 or 30 feet, and the discharge end must be lower than the suction end.

Slack—Small coal which will pass through a small screen.

Slip—(1) A fault. (2) A smooth joint or crack in seam.

Slope—The main engine plane or inclined roadway driven in the seam of coal; worked from the out-crop, up which the whole of the product of the mine is raised by the winding engine.

Sprag—(1) A short billet of wood used to lock the wheels of a mine-car in place of a brake. (2) A short wooden prop, set in a slanting position for keeping up the coal while it is being undermined.

Squeeze—See creep.

Steam coal—A hard, free-burning, non-caking coal.

Steam jet—A system of ventilating a mine by means of a number of jets of steam at high pressure kept constantly blowing off from a series of pipes in the bottom of the up-cast shaft.

Stopping—An air-tight wall, built across any passage-way in a mine.

Strip—To remove the overlying strata of a bed of mineral and take it out by open work.

Sump—A receptacle into which the drainage of a mine flows and from which it is pumped to the surface.

Sulphur—Iron pyrites

Tamp—To fill up a bore-hole above the charge with some strongly resistant substance, rammed hard upon the powder.

Timber—(1) Prop, bars, collars, lagging, etc. (2) To set or place timbers in a mine.

Tram-road—A mine track or railroad.

Trapper—A small boy employed underground to open and shut doors during the passage of trips.

Trouble—A dislocation or fault; any irregularity in the bed.

Up-cast—The shaft through which the return air ascends and is got rid of.

Vein—A seam of coal or other mineral.

Ventilation—The atmospheric air circulating in a mine.

Waste—See goaf.

Water-gauge—An instrument for measuring the drag or friction of air in mine.

Water-level—An entry or gangway driven very nearly level, for the purpose of draining.

White damp—Carbonic oxide, a gas occasionally found in coal mines, generally a product of combustion. Although it will support combustion, and under certain conditions it is inflammable, it quickly destroys life.

Workings—The openings of a colliery, including all roads, rooms, headings, entries, etc.

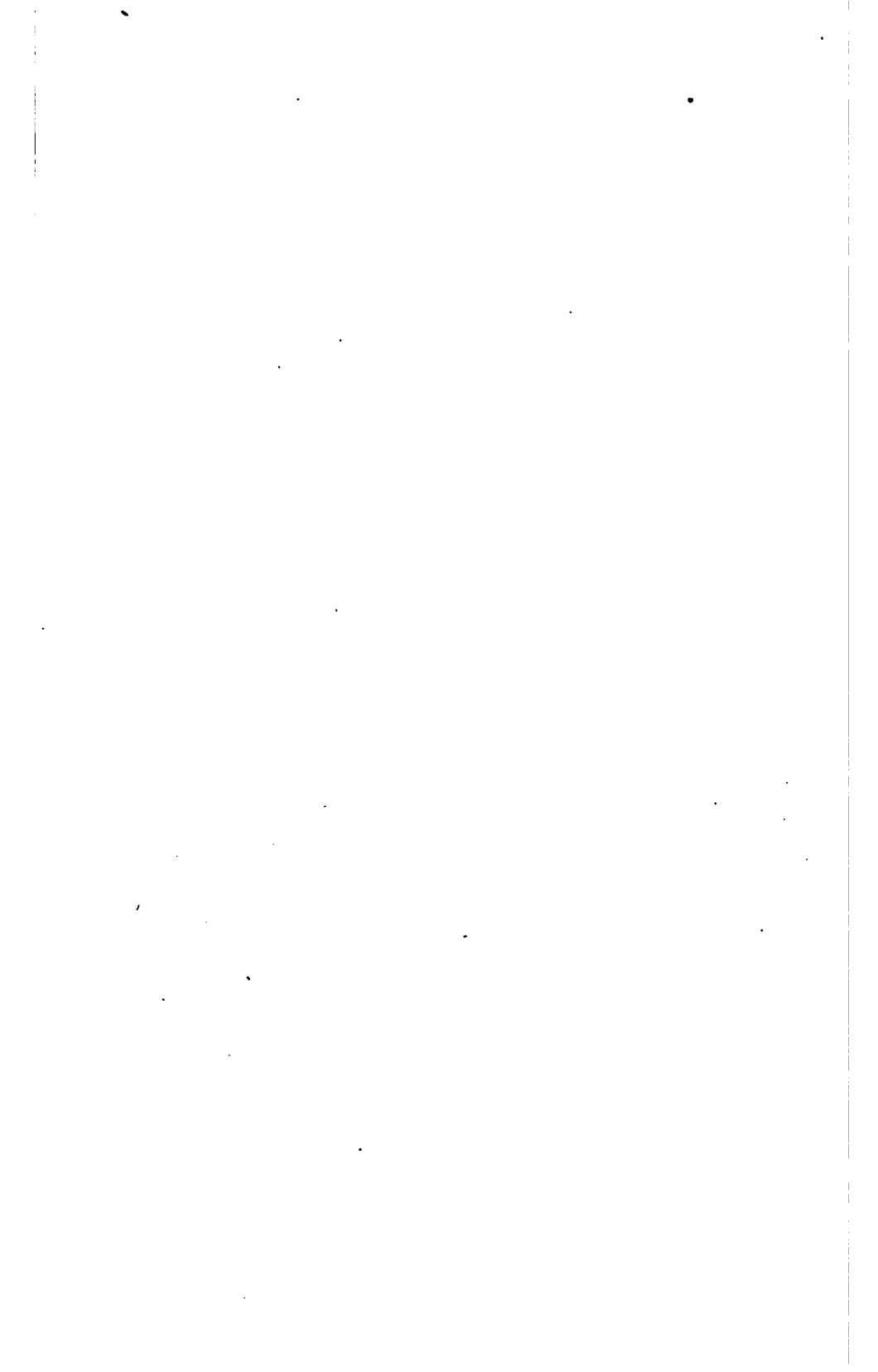


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REPORT.

STATE OF MISSOURI,
OFFICE OF STATE MINE INSPECTOR. }

To the Hon. HENRY BLACKMORE,
Commissioner of Labor, Jefferson City, Mo.:

Sir—In accordance with section 7072 of the Revised Statutes of Missouri, I have the honor of submitting to you the Seventh annual report on the zinc, lead and iron mines of the State, for the year ending June 30, 1893.

As you are aware, the last General Assembly enacted a law making two "State mine inspectors," one exclusively for coal, the other for all other than coal mines. Under this law I was appointed by the Governor, late in July last, giving me but a short time in which to collect the necessary data for this report. I found great difficulty in securing figures for the tables, owing to the fact that nearly all the zinc and lead mines in the southwestern part of the State had shut down on account of the recent financial depression and the attendant low prices of ore. The superintendents in many cases were not at the mines, and had to be looked up. Where it was possible, I saw them personally, but, as I could not see them all in time allotted by the law, I had to resort to letter-writing, which did not prove very satisfactory. Hence the tables may not be found as comprehensive and full as they might have been had the mines been working as usual, and the superintendents there to give the information required.

The table of accidents will be found very small in proportion to number of men employed. It, in fact, includes only those who reported them voluntarily. As not being in office at all during the year for which this report is made, I could not secure more information. However, the next report will show the full list of casualties occurring.

I would call your especial attention to the article on zinc from the pen of Prof. W. H. Seamon, who has been identified with the zinc and lead mines of Southwest Missouri for some years; therefore thoroughly familiar with the mines, and, as the article shows, with the subject. It will undoubtedly prove of value to the miners of zinc, in showing

how the product of their mines could be increased and utilized. Therefore, I have incorporated it in my report, and, before closing, allow me to thank Prof. Seamon for the article, and congratulate him also on the able manner in which he has handled the subject.

Very respectfully,

FRANCIS A. LAGRAVE,
State Mine Inspector.

In presenting this the seventh annual report on the zinc, lead and iron mines of the State, I am sorry to call attention to the general decrease in the production of ore. This, I am confident, is caused in a great measure, if not entirely, by the extreme stringency of the money market, and consequent low prices of ore. Many of the mines have been idle for a long time; and their owners tell me that they will not start them up again, until such time as they can be made to pay. It cannot be done now, on account of the low prices. However, just as soon as prices become remunerative, the production of ore will increase in proportion to the demand. Especially is this the case with the zinc and lead mines which are practically inexhaustible, and can be made to produce in proportion to the developments made, for their production.

Many of the former employes of the mines which have shut down are now engaged in prospecting on their own account, and have made several valuable discoveries of ore, which will become good producers. The closing of these mines seems only to have changed the manner of occupation of the miners, as there are comparatively few men out of employment around the mines.

The tables do not show as large a production of ore as there was last year, and the average prices of all the metals, as well as of ores, are lower, yet the production of 108,591 tons of zinc ore and 40,297 tons of lead ore, with a total value of \$3,830,597.73, shows that the mining interests of the State are large, and can be increased almost indefinitely if remunerative prices can be obtained for the product.

The iron mines of the State seem to be on the verge of closing down altogether, if we may judge from their production of the past year. The only mine that has shown any vitality during the past year is the Iron Mountain, and this is far from producing what it formerly did. The general depression of business, low prices of ore and the

great competition to be met with from other states have been some of the causes which have limited the production of ore. The pig-iron furnaces in the State have all shut down, and it is almost impossible to sell ore at any price. The total production was 86,983 tons of ore, valued at \$203,171.63, which is very small for the number of mines in the State.

The article on zinc, by W. H. Seamon, Professor of Chemistry, Missouri School of Mines at Rolla, Missouri, incorporated in this report, embraces the products of the world in its tables, shows the amounts consumed in each industry in the old world, as well as in the new, and points out plainly those industries which, if established in this country, ought to double our consumption, and consequently increase our production very much in this State. The article shows much thought on the subject, as well as a great amount of research in the tedious work of compiling tables of this character. It is well worth the attention of all persons interested in zinc, whether they be miners, smelters, manufacturers or consumers of this metal.

THE ZINC INDUSTRY.

By W. H. SEAMON,

Prof. of Chemistry, Missouri School of Mines.

As Missouri is the largest producer of zinc ore in the United States, and with the adjacent mines of Southeastern Kansas, produces about 75% of the ore consumed in this country, it is believed that a review of the industry will be of much interest, and it is hoped of great benefit to its citizens.

The difficulties surrounding the collection of accurate statistical information concerning the zinc industry of the world, while not now so great as in previous years, are still greater, for some unknown reason, than those surrounding any other of the useful metals. It is reasonable to presume that this lack of information is alone sufficient to account for the low estimation in which the metal is held by the people of this country; for it possesses properties of the highest value, which when considered with its low cost, renders it surprising that the people of the United States do not use twice as much of it as is now annually consumed.

The materials for this article have been derived from some practical acquaintance with the industry, from a study of all available sources of information, and by correspondence with men more or less intimately acquainted with the subject. The statistical tables have for the most part been taken from the Mineral Industry for 1892, the most accurate and comprehensive review of the mining industries ever published; these statistics have been corrected by the writer in those instances in which he has been able to secure later information than was available at the be-

ginning of the year when this work was published. The American representative of the Vieille Montagne Zinc Company of Belgium has been of great assistance in securing information about zinc as a roofing material, as well as on other points concerning the industry in Europe.

THE WORLD'S PRODUCTION OF ZINC ORE IN TONS OF 2000 POUNDS.

	1891	1892		1891	1892
Great Britain	29,100	25,000	Greece	31,498	30,772
Sweden	68,424	69,705	Algiers	9,580	22,711
Norway	1,200	1,257	France	6,500	7,008
Spain	55,817	53,009	Poland	11,980	12,066
Russia	34,107	33,913	Kansas and Missouri	137,376	156,400
Italy	134,094	133,112	Iowa, Ark., Wis. & N.M.	3,790	3,895
Germany	881,716	893,918	Virginia and Tennessee ..	13,512	14,820
Belgium	21,421	15,870	New Jersey and Penn....	63,175	67,213
Austria	33,142	30,895	Totals	1,542,887	1,563,560
Hungary	2,460	2,960			

The above table includes all countries producing zinc ore.

The mines of Great Britain, now nearly exhausted, mainly produce blende. The Belgian mines produce carbonate of zinc with some blende, principally as a by-product of their lead mines; their production is rapidly decreasing, and eventually the Belgian smelteries will have to entirely depend upon foreign supplies of ore. In France carbonate of zinc and blende are produced as by-products from the copper and galena mines; their production is not likely to largely increase, but will hold its own. About 60% of Germany's production is the carbonate of zinc, the remainder blende. The production will hold up for many years, the blende production increasing as the carbonate decreases. The cost of mining is small, and the ores are usually associated with lead ores. The zinc ores of Germany are quite poor in their zinc content, for which due allowance should be made in comparisons of the ore productions of different countries. Cheap coal and cheap labor fully compensate for this disadvantage.

The production of Sweden and Norway is mainly blende, derived from the lead and copper mines; the production will increase with the demand for ores of zinc.

The island of Sardinia is a large producer of carbonate of zinc. The mines are largely operated by the Belgian zinc-smelting companies, who ship the product to their furnaces for treatment. The production is certain to increase.

But little change is to be expected in the production of carbonate of zinc and blende from Spain.

The production of Russia will undoubtedly largely increase as other European sources of ore supply diminish.

But little change is to be expected in the productions of the other European countries. The production of Algiers and Northern Africa will become greater.

In the United States the production of the Eastern states will probably decrease, except in Tennessee. The Arkansas, Kansas and Missouri fields are only partially developed, and if the demand for ore increases their production will largely increase, and may continue indefinitely. The silver producing states will become large producers of zinc ores whenever there is a better demand for the ore and transportation facilities become cheapened.

THE WORLD'S PRODUCTION OF SPELTER IN TONS OF 2000 POUNDS.

	1891	1892		1891	1892
Austria	72,128	403,250 (est.)	Illinois.....	28,680	30,300
Spain.....	20,567		Kansas.....	21,480	23,088
Great Britain.....	32,939		Missouri	16,205	16,161
Poland	4,211		Eastern and Southern states.	13,338	13,751
Belgium and Rhine dist.....	156,458		Totals.....	463,095	485,500
Silesia	96,529				

THE WORLD'S CONSUMPTION OF SPELTER—1891.

	Tons.		Tons.
United States	75,000	Germany	60,000
India	10,000	Belgium.....	65,000
Russia	4,500	Austria.....	24,000
England.....	106,000	Other countries and unaccounted for.	56,595
France	63,000	Total	463,095

ZINC—PRICES OF COMMON WESTERN SPelter IN NEW YORK, 1875-1893, INCLUSIVE.

[Cents per pound. Figures in parentheses are combination prices.]

Years.	Year											
	January.		February.		March.		April.		May.		June.	
	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...
1875.	6 75	6 37	6 75	6 35	6 50	6 20	6 50	6 50	6 50	6 50	6 50	6 50
1876.	(7 60)	7 40	(7 75)	7 62	(7 75)	7 62	(8 00)	7 60	(7 25)	7 15	(7 25)	7 15
1877.	6 50	6 25	6 50	6 25	6 50	6 25	6 50	6 50	6 50	6 50	6 50	6 50
1878.	5 75	5 50	5 75	5 50	5 75	5 50	5 75	5 50	5 75	5 50	5 75	5 50
1879.	4 50	4 25	4 50	4 25	4 50	4 25	4 50	4 25	4 50	4 25	4 50	4 25
1880.	6 50	6 25	6 50	6 25	6 50	6 25	6 50	6 25	6 50	6 25	6 50	6 25
1881.	5 25	5 00	5 25	5 00	5 25	5 00	5 25	5 00	5 25	5 00	5 25	5 00
1882.	6 00	5 75	6 00	5 75	6 00	5 75	6 00	5 75	6 00	5 75	6 00	5 75
1883.	4 62	4 50	4 62	4 50	4 62	4 50	4 62	4 50	4 62	4 50	4 62	4 50
1884.	4 37	4 20	4 37	4 20	4 37	4 20	4 37	4 20	4 37	4 20	4 37	4 20
1885.	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30
1886.	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30	4 50	4 30
1887.	4 60	4 50	4 60	4 50	4 60	4 50	4 60	4 50	4 60	4 50	4 60	4 50
1888.	5 37	5 20	5 37	5 20	5 37	5 20	5 37	5 20	5 37	5 20	5 37	5 20
1889.	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95
1890.	5 41	5 28	5 41	5 28	5 41	5 28	5 41	5 28	5 41	5 28	5 41	5 28
1891.	5 55	5 025	5 55	5 025	5 55	5 025	5 55	5 025	5 55	5 025	5 55	5 025
1892.	4 69	4 62	4 69	4 62	4 69	4 62	4 69	4 62	4 69	4 62	4 69	4 62
1893.	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95	5 00	4 95

St. Louis prices are usually 0 3 below New York prices. The New York quotations for week ending Oct. 7, 1893, were 3 65, a falling off as compared with prices of the few weeks preceding, the result of increased offerings by the smelters and a diminished demand by consumers.

ZINC MINING AND SMELTING IN EUROPE.

The conditions of zinc-ore mining and smelting in Europe are much different from those existing in this country, particularly in the Missouri district. In the United States there are about 25 smelters engaged in the production of about 80,000 tons of spelter, of which not more than five are also engaged in the operation of zinc mines.

In Europe there are in all only about 50 companies employed in the production of about 400,000 tons of spelter. These companies, with but few exceptions, are also largely engaged in the mining of the ores, not only in their own countries, but in foreign countries as well. These companies are situated as follows: Four in Austria, producing about 7000 tons of spelter per annum; one in Spain, producing about 20,000 tons; 13 in Great Britain, producing about 33,000 tons; two in Poland, producing about 4000 tons; 14 in Belgium and the Rhine district of France and Germany, producing about 160,000 tons, and 15 in Silesia, producing about 95,000 tons. The above mentioned companies control not only the production of spelter, but that of the ore as well.

To form a clear idea of the differences, it is well to examine the organization of the largest zinc company in the world—that of the Vieille Montagne Zinc Company of Belgium. Its organization is a type of the others and its system furnishes an excellent model for those engaged in the industry in this country.

This company operates three smelters in Belgium, and one each in France and Germany; three zinc rolling mills in Belgium, four in France and one in Germany; two zinc oxide plants in France and Germany, four mines in Belgium, four in France, four in Algiers and Tunis, six in Germany, two in Sweden and eight in Sardinia. At these mines the necessary dressing works are located, and in many instances the ores are calcined or roasted before shipment to the smelteries. Agencies for the purchase of ores are located in all the centers of the zinc-producing areas of Europe and Africa. This company treats about 200,000 tons of ore per annum, and employed in its various works and mines on December 31, 1892, 7301 men.

All of the European companies are united into an organization for the control of the prices of spelter. They accomplish this object: First, by keeping the production within the demand or consumption; second, by regulating the production of ore to the amount required for the manufacture of spelter. Previous to the organization, the spelter market was as variable as the winds, and the industry was in a demoralized condition. During the past five years the organization has commended itself to those interested by its results. The organization has made the spelter market stable, has maintained spelter at a fair price, usually about one-half a cent per pound greater than the American prices; and the companies have all made fair profits. The American producers took advantage of this condition in 1892, to unload from 6000 to 7000 tons of their surplus on the European market. They easily succeeded in disposing of it at the prevailing prices, thereby relieving the congested condition of the American spelter market, without loss to themselves. But they broke the European price convention, for the reason that this convention was intended for the benefit of the European smelters, and they could not afford to give up the market which they had created to the American producers. Today, as a consequence, the London prices are kept at about the American prices, so that further shipments cannot be made except at a loss to the American producers. There is no doubt but that the London prices will be made to drop still lower if it is found necessary, to prevent American shipments of

spelter to Europe. Under these conditions it is not probable that further shipments will be made, for the American producers cannot compete with the European producers in the American market, if the European producers should determine to retaliate. Fortunately the European convention has only been suspended temporarily as to prices, and is still maintained for the limitation of the production of ore and spelter.

If it were not for the protection afforded the American producers by the tariff on spelter, the European producers, favored as they are by cheap ores, cheap coal and cheap labor, would cease to control their production and market their surplus in this country. Such action on their part would paralyze the zinc industry of the country. The European producers are, however, willing to let our market alone under present conditions, and it is to the interest of American producers of ore, if not also to the smelters, to leave the European market alone, for interference with it depresses prices abroad and in this country. The European producers will require us to keep our hands off from their market.

The smelters of Great Britain are members of this trust, and while they are buyers of ores and are not directly interested in the operations of the European mines, their interests are so closely allied with their associates that they are not likely to buy ores from our markets if it should not meet with the approval of the members of the organization who are miners of ore as well as smelters. The American ore-producers cannot afford to sell to England their surplus production at the prices England can now secure its supplies from European sources. The ores of Germany are sold at \$9 per ton at the mines, and the ores of Italy, when sold, can be had for from \$9 to \$12 per ton for the carbonate, which is better and richer than the American silicate, and the blende is sold at from \$15 to \$20 per ton, on a sliding scale based upon the price of spelter. Transportation rates are against us in Missouri to justify the hope of relief from a foreign ore market.

ZINC MINING AND SMELTING IN THE UNITED STATES.

Aside from three or four companies located in the Eastern States and one in Southwest Missouri, which mine as well as smelt, the interests of the smelters and ore-producers in this country are diametrically opposed. The smelters are desirous of buying their ores at as low a figure as possible, while the miner wishes the full value of his ores. Unfortunately for the miner, there is an over-production of ore which practically places him at the mercy of the smelter. It is to the interests of the smelters to encourage this over-production. They do this by raising the price of ore a little whenever the miners become discouraged, and dropping it again, as suits their convenience. They do this regardless of the condition of the spelter market, as the ores are not bought upon their assay value. We do not say this as a criticism on the smelters, for they are justified in making all they can out of the condition of affairs. They run their business upon business principles.

The smelting capacity of the smelteries of the United States on the first of January, 1893, equaled 104,000 tons per annum, or nearly 30,000 tons in excess of the consumption of the country. In 1892 these smelteries produced 83,300 tons of spelter, which they succeeded in marketing in this country and Europe. To produce this amount of spelter they purchased about 243,000 tons of zinc ore, from which they could have made about 120,000 tons of the metal. What they did not use remained in their bins.

Two-thirds of the ore mined in the United States comes from three counties in Southwestern Missouri and one in Southeastern Kansas. Although located in two states, they are practically one and the same. The conditions of mining are

the same in each, the interests of the one are the interests of the other. With but one exception, none of the smelting companies are directly interested in mining. In Eastern states this is not generally the situation, for all the smelting companies are more or less engaged in the mining of ores of zinc. The description which follows is therefore applicable to the Missouri district only.

Most of the mining lands of the Missouri district are owned by companies who lease their lands on royalties to miners, or companies organized for mining only. There are about 150 such land companies, a few of whom also mine on their own account. These companies take none of the mining risk, spending but little, if anything, in prospecting. Under such circumstances they are not equally interested with the miner in securing the best possible returns from the ore. They want their lands worked and royalties paid, no matter whether the miner gets them out at a profit or not. A fall in price of ore of \$1 per ton reduces the income of the land owner for from only 5 to 20 cents per ton per week, while the income of the miner is diminished from 80 to 95 cents per ton. The land owner does not appreciate the diminished income so much as the miner, who frequently finds by so slight a change in price of the ore his income is diminished so much as to make a loss where formerly there had been a profit.

There are about 300 of these mining companies, a few organized with a fair amount of capital, but most of them limited partnerships, with inadequate means to properly work their leases. The production of these small properties must be sold at regular intervals, for the miner must have the money to pay his hands and to live himself.

During 1892 the mines of Missouri (including those of Cherokee county, Kas.) furnished 167,000 tons of ore to the smelteries of the district. Large amounts of ore were still in the bins at the mines at the close of the year, held partly for lack of a market and partly in hope of better prices. Thus the year 1893 opened with consumers largely supplied with spelter; the smelteries with unusually large stocks of spelter and ore on hand, and the bins of the miners filled with ore. Since then the price of spelter has gradually been falling, and the price of ore has done likewise. The production of ore has steadily fallen off during the year, and it now appears that the production will be 50 per cent less than in 1892, and still the ore market has improved but little, if any.

At the beginning of 1893 the average price of ore was \$22 per ton. It has steadily decreased and has reached the low point of \$16. It suddenly increased in the early part of October to \$20, without any good reason being known therefor, and has again been lowered to \$18.50, the top price for the week ending October 14, 1893.

Spelter is at the same time selling for 3.65 cents per pound in New York, as against 4.40 at the beginning of the year, with a light demand from consumers. There can be no doubt but that the prevailing business depression has affected the zinc industry to a considerable extent, but it cannot account for it all. The great activity in spelter since 1887 has caused large developments of ore bodies in the Missouri district. The demand for the spelter has been caused by cheap copper, stimulating the use of brass at low prices, and the increased and unusual activity in the galvanizing of iron. The spelter sold rapidly at fair prices, and there was a good demand for ore at high prices at the beginning. As the production increased far more rapidly than the consumption of spelter the prices, of ore began to fall off long before the price of spelter was sensibly reduced. At first the falling off in the prices of ore excited no alarm, as the producers were buoyed up with the statement that their surplus ore could be marketed in Europe. In 1891 one or two

shipments of ore were made from the district to Europe and fairly good prices were received from English smelters. In 1892 the Mining Association sent Mr. A. V. Weise abroad to make efforts to bring the Belgian smelters into our ore markets as purchasers of our ores. Mr. W. returned, and reported that while they were favorably impressed with the unusual richness of our ores they did not care to buy, for the reason that they did not need our ores; they had all that they could use, close at hand, secured by long contracts at satisfactory prices. They gave no encouragement except at lower prices than the American producers were at that time receiving and could afford to mine. This report gave the death-blow to the hopes of those who expected to find relief in a foreign market.

About 3000 tons of ore were shipped during the year 1892 to Great Britain, and it was stated that contracts had been made for more, but these contracts called for lower than the prevailing prices, and did not justify shipments which had been made with the hope that the excellent quality of our ores would commend them to the smelters of Great Britain, and induce them to pay the market prices here; but this effort failed.

The smelteries of the district continued to buy ore at low prices, and soon found themselves in a position where it became necessary for them to find a foreign market for their product, or else curtail their business. Prices were dropping in New York, and tempted by the London prices, they shipped about 7000 tons to Europe, which they sold, and for reasons previously mentioned, broke the price there to below the then New York quotation, still further depressing New York prices.

The Missouri district as now developed is capable of easily producing 200,000 tons of zinc ore per annum; and if there was a demand for the ore, they could increase the production at least 40,000 tons more per annum without taking a single pound more of the crude ore out of the ground. This statement may seem wild to those unacquainted with the district, but it is very moderate. The writer is able to refer to the opinions of mining engineers of standing, who have examined the methods of mining and concentrating in the district, who have estimated the possible saving at much higher figures. Prof. Carl Heinrich, in a recent article on Webb City deposits, published in the "Transactions of the American Institute of Mine Engineers" (page 10, Vol. XXI), says: "It is no exaggeration to say that in many cases over one-half of the zinc blende contained in the vein matter is lost in the concentration."

A very conservative estimate for the entire district would place the loss at not less than 33½%, of which at least one-half could be saved with ease by slight improvements in the concentrating machinery. These losses are not unknown to the larger operators, but they do not consider it good policy to save and still further burden the over-stocked ore market. No great improvements in mining and cleaning are to be expected until there is a better market for the ore. The small producer, frequently employing only the labor of himself and family, can always make a living at prices which would mean ruin to large operators.

USES OF ZINC.

Zinc, or spelter, as the unmanufactured metal is usually called, is largely employed in the zinc process for the desilverization of lead; for the manufacture of brass; for galvanizing iron and steel plates and wire; for the manufacture of monuments, window sills and caps, etc. etc. It is largely converted into sheet metal, particularly in Europe, in which form it is principally employed for roofing purposes; for sheathing vessels, taking the place of copper and yellow metal. In

thick plates it is used for the preservation of boilers. For this purpose a plate of rolled zinc is suspended by an iron rod in the boiler; the galvanic current set up not only prevents incrustation, but saves the wear on the boiler at the expense of the zinc. About 180 pounds per annum is consumed for every 100 H. P. It is also suspended in the feed water heater to clear the water, with satisfactory results.

Zinc nails are employed for the purpose of fastening the sheet metal to sheathing, and for holding the slates of roofs in place,

Rolled zinc can be chased, spun, punched or stamped into useful and ornamental forms of great artistic beauty, and is employed for the construction of ornamental ceilings, mouldings and friezes. Rain-water cisterns, downfalls, water-cans, bath-tubs, wash-boards, soap-dishes, stair treads, coal-scuttles and other articles of a utilitarian character in household economy are made from the sheet metal. The metal toys made abroad are usually composed of sheet zinc. It is also used in making the hard foundation for cloth and linen buttons. Sheet zinc and zinc foil are used in lining packing cases and wrapping goods to preserve them from dampness, or water. Sheet zinc, specially prepared, is used in the art of zincography, which is so much cheaper and more rapid than that of lithography. In glazing paper large sheets of heavy zinc are used. Perforated sheet zinc is used for blinds, flower-baskets, meat-safes, screens, etc. Zinc is quite ductile, and is drawn out into wire from 0.019" in diameter and upward. In this form it is used for clothes-lines, hair-pins, netting and in tying up vines. In the form of rods, plates, cylinders, etc., zinc is largely employed in electrical batteries. It may be drawn or compressed into any desired form.

Zinc is well adapted for castings; it takes a very sharp impression of the mold, and as it is quite fusible, it is largely employed in the manufacture of statuettes and other objects of ornamentation. They are highly polished and frequently colored to resemble other metals. So beautiful are they that many of their possessors would find it difficult to believe that the beautiful ornaments of their handsome parlors were made from common zinc.

Zinc has long been employed in Europe for monumental purposes, and has there stood the test of time and exposure. In the United States it is now being introduced for such purposes under the name of "white brnze." It is usually finished off with a sand-blast, which gives the metal a beautiful rough finish, far more beautiful than granite or marble. A number of the best monuments erected in this country in recent years have been made from this material. It is cheaper than granite or marble, and is more susceptible of artistic treatment. It is far more durable in this climate than stone of any quality. Its beautiful dull gray color harmonizes with the surroundings of and is appropriate to a cemetery. The metal becomes if anything more beautiful with age.

Burial cases are not only lined with sheet zinc, but sometimes the entire body is made of it. It preserves the body, and should always be employed in those instances when the remains must be transported for long distances previous to interment.

An effort has been made to discover the exact ways in which spelter was consumed in the United States, but the results have not been satisfactory. The following approximation for 1892, based upon inadequate information, may, however, prove instructive, and if it only succeeds in arousing interest in the subject and discussions on account of its inaccuracies, it will well have served my purpose by bringing out needed information on this point:

An approximated estimate of the consumption of spelter in the United States during the year 1892.

Brass	30,500 tons	Monumental work.....	800 tons
Galvanizing	35,000 "	Alloys and unaccounted for.....	8,200 "
Sheet metal.....	10,000 "	Total	75,000 tons

ZINC OXIDE.

About 17,000 tons of zinc oxide were made during the year 1892 in the United States. The manufacture of this product is chiefly confined to the Eastern states, and is made directly from the ore and from the dross derived from the production of spelter. About 1500 tons were imported. The imported article is made from spelter, and commands a higher price on account of its greater purity and better color. The production of oxide in the United States has not perceptibly increased during the past eight years. It makes a valuable pigment, and might, if properly pushed, become an important competitor of lead.

Zinc oxide is said to possess the following advantages over lead as a pigment: It covers proportionally a larger surface; is susceptible of receiving a higher finish; is unchanged by exposure and by light; the workmen do not suffer from colic or palsy, and the cost of the pigment is about the same as that of lead paint. Besides its use as a pigment, it is employed in vulcanizing rubber; the manufacture of crystals and enamels; in cotton printing; in the manufacture of linoleum, oil-cloths; in glazing paper; in the manufacture of cements, toilet powders, and in the manufacture of porcelain and china.

ZINC FOR ROOFING.

Zinc for roofing is entirely unknown in the United States. The Illinois state-house is the only building ever roofed with it in this country. This is a remarkable fact, for sheet zinc is the most popular roofing known to Europeans. It is indorsed by all the architects and builders, and becomes more and more popular every day.

About 250,000 tons of the spelter produced in Europe is converted into sheet zinc, of which about 135,000 tons is employed there in roofing; some is shipped to India for that purpose. For roofing purposes zinc is rolled into sheets from 0.029" to 0.058" in thickness, three feet in width and from three to ten feet in length. It is put on in sheets, smooth or corrugated, in a manner similar to the way in which sheet iron is used in this country for roofing. It is also stamped into patterns of tiles and other forms which enable very artistic effects to be had. On account of the great expansion of the metal, it must be laid by a competent person, for it cannot be laid successfully by anybody.

As the metal weighs but about 135 lbs per square, the roof timbers do not need to be made so heavy. No sheathing at all is required for the corrugated form.

The first cost in this country would be less than for slate, perhaps, but certainly little more. With spelter selling at five cents, it could be laid for about \$11.30 per square. On exposure it speedily becomes coated with a closely adhering coating of zinc oxide, which is insoluble in water and protects the metal from further corrosion. It is never painted, as it is impossible for man to do a better job of painting than that done by nature in the formation of this gray coating. The color thus imparted harmonizes with the sky colors and never becomes glaring. The roof of this material lasts for from 15 to 75 years, without painting and

without repairs, except for soldering small holes, occasionally made by throwing sharp stones against it. When removed it is worth about one-half the value of new spelter. It is undoubtedly the best roofing and the cheapest, considering its great durability, that has ever been proposed. In Europe it is used on all public buildings, on the residences of the wealthy and middle classes. There are roofs in Europe which were laid in 1830, and even earlier, which exist today in good condition and which have never required repairs. It is increasing in popularity, as shown by the consumption of it, which in 1860 amounted to only about 20,000 tons.

CONCLUSIONS.

A careful study of the conditions of the zinc industry in the United States, particularly when viewed with reference to the continued prosperity of Missouri's mines, leads to the following:

First—The miners and smelters of the United States must depend entirely upon the home market to consume their production.

Second—That, unless the consumption largely increases, the production of ore must largely cease.

Third—That new uses must be found for the metal and old ones stimulated, not only by the miners of the ore but by the smelters.

As conditions now exist the miner of zinc ore is at the mercy of the smelter, and he is most interested in increasing the consumption of spelter. It is not possible to organize a convention of the miners whereby they can, with advantage to themselves, successfully control the production of ore and thereby control the prices paid for it by the smelters. The legitimate demand for zinc ores in the United States is not greater than 200,000 tons per annum. As the production of the Eastern states amounts to about 75,000 tons per annum, and is controlled by the smelting companies, which do the greater part of the mining, Missouri will only be called upon to furnish about 125,000 tons. As now developed, the production cannot be kept down to these figures and the prosperity of the district continue undiminished.

About 1850 a similar condition existed in Europe. The *Vieille Montague Zinc* company undertook to educate the people to use zinc for those purposes to which it was suited. They published pamphlets and placed them in the hands of architects and the people generally. In particular they undertook to increase the consumption of zinc for roofing purposes. Their great success points out the way for a continuance of the prosperity of the zinc industry of the United States. If the miners of zinc ore were to organize in connection with some smelter, erect zinc rolling mills, embark in the manufacture of the roofing, educate workmen to properly lay it, issue circulars of information to architects and builders, and put the roofing on under guarantees, they would so increase the consumption of spelter in this country that in less than two years they would create such a demand for their ores that they would find it difficult to meet it. In doing this they would not only increase the value of their ores, but would benefit the people generally and be engaged in a safe and profitable industry.

ACCIDENTS IN MINES.

The accident table shows a very small number of accidents in proportion to the number of men employed in and about the mines, more especially those which are non-fatal. This is partially accounted for by the comparatively small number of mines worked in the latter half of the fiscal year, and as mentioned in my letter of transmittal, the fact that the year represented in this report had already expired before my appointment to office. Few mine owners or superintendents will voluntarily report accidents of any kind, and it becomes a very hard matter to look up the causes of an accident which happened a year or more ago. This is especially so when persons are adverse to their publication. Hence I have been compelled to accept such as have been reported, and compiled the table accordingly.

I see that the courts have given a widow \$2500 damages for the death of her husband caused by bad or careless mining, viz.: defective cribbing of shaft. A few more verdicts in this line will make owners and superintendents more careful of the lives of their employes, for they will find it cheaper to make their works secure and safe than to pay verdicts of this kind and their attendant expenses. The proportion of fatal and non-fatal accidents, as shown by the table, proves conclusively that many accidents have not been reported. In fact, several of those shown in the table were taken from the newspapers and afterward confirmed by some of the employers. This is gross negligence on the part of the employer, which will be remedied as far as possible before another report is published.

TABLE I—SUMMARY OF GENERAL RESULTS

For the year ending June 30, 1893, as compared with the years 1891 and 1892, in lead and zinc mines of the State.

	1891	1892	1893
No. counties in which lead and zinc are mined	17	14	8
“ mine-shafts in operation.....	610	677	573
“ tons lead ore mined.....	16,925	49,426	40,297
“ tons zinc ore mined.....	123,752	131,488	108,591
Average value lead ore per ton, at mine.....	\$49 10	\$44 21	\$39 34
“ zinc “ “	\$21 60	\$21 76	\$20 57
Total value of lead and zinc ore.....	\$5,084,463	\$5,056,505	\$3,830,597
“ number of all employes.....	5,065	5,915	5,864
“ “ pumps in use.....	404	326	194
“ “ crushers in use.....	147	172	127
“ “ steam-jigs in use.....	273	320	302

TABLE II--SHOWING THE PLANT, EMPLOYES, TONNAGE AND VALUE OF PRODUCT OF LEAD AND ZINC MINES IN MISSOURI FOR YEAR ENDING JUNE 30, 1893.

County.	No. of mines.....	Machinery in use.				Total.....	No. of men prospecting.....	Total tons of lead.	Total tons of zinc.	Av. price received per ton at mines.		Amount received for		Total amount received for year's output of lead and zinc.....
		Boilers...	Pumps...	Crushers...	Steam-jigs	Miners...	Others...			Lead.....	Zinc.....	Lead.....	Zinc.....	
Dade.....	309	153	115	89	105	2511	720	10,241	220	42 47	33 20	\$454,988 55	\$1,320 00	\$1,320 00
Jasper.....	40	33	19	11	16	75	25	1,023 7	82,557 2	33 60	9 00	24,338 45	1,883 447 37	2,293 415 92
Jefferson.....	87	7	4	1	12	280	248	2,194 5	1,563	43 69	17 84	68,670 45	14,053 00	48,454 46
Lawrence.....	8	63	37	12	24	164	119	4,155 9	16,178 8	40 07	12 10	190,324 89	238,833 84	352,594 39
Madison.....	63	37	38	12	24	252	105	1,457 1	8,043	31 74	20 57	63,380 80	107,349 59	199,324 39
Newton.....	6	21	15	14	145	599	165	20,248 8	.....	.....	.....	737,012 89	.....	165,740 49
St. Francois.....	65	3	3	.....	.....	50	.....	576 6	.....	.....	.....	27,804 77	.....	737,012 89
Washington.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,804 77
Totals.....	573	259	194	127	302	3731	1382	40,397 6	108,561	39 34	20 57	1,536,568 93	3,245,023 90	3,880,567 73

TABLE III.—This table is an exhibit of the details of lead and zinc-ore mining in the several counties of the State producing these ores. It embraces a list of the operators, number of shafts and depths of same, the machinery in use and number of men employed, the tons of lead and zinc ores produced and average prices received for same. The difference which will be noticed in prices of lead ore may be accounted for as follows: In Madison and St. Francois counties the ore land is owned by companies, which not only mine the ore, but smelt it also; while in Jefferson and Washington counties the smelters, in furnishing the price paid for ore, have not considered the royalty as a part of its value, considering only the actual money paid out for its mining.

[illegible]

JEFFERSON COUNTY.

Valle Mining Co	40	75	75	25	100	10	1,023.70	1,593	\$88 60	\$9 00	\$94,386 48	\$14,068 00	\$48,454 48
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LAWRENCE COUNTY.

Name of person or company operating mine.	Shaft.		Machinery used		Employees.		No. of men prospecting		Total No. tons mined.		Av. prices rec'd per ton at mine		Total amount received for		Total receipts from the year's output of lead and zinc ores.....	
	Number	Av. depth in ft	Boilers	Pumps	Crushers	Steam-jigs	Miners	Other employees	Total	Lead	Zinc	Lead	Zinc	Lead ore	Zinc ore	
Baldwin & Baldwin	4	16					8	8	16	65 10	340 30	\$40 00	\$13 00	\$2,605 60	\$4 423 64	\$7,029 24
Berry Mining Land	3	35					9	6	15	21 60	48 50	42 00	10 00	3,907 09	484 55	1,391 64
Brinkerhoff Zinc Co	5	5					20	20	40		951 30		18 65		17,742 35	17,742 35
Cleveland & Aurora Mining & Land Co	15	35	4	4	3	3	64	34	98	409 40	3,694 50	40 00		16,377 20	94,442 95	108,820 15
Decatur Lead & Zinc Co	5	60	2	2	10		19	16	35	64 30	83 80	43 84		5,789 65	1,023 53	3,813 09
Elliott, S. G.	4	18	3	3			3	3	6	125	100	40 00	10 00	5,000 00	1,000 00	6,000 00
Kentucky Mining Co.	11	100	5	4	1	1	35	43	77	309 20	1,233	43 25		13,405 89	18 411 61	31,817 00
Louisville Lead & Zinc Co.	9	60	1	1			18	14	32	118 40	641 50	44 25	14 28	5,241 49	9,160 40	14,401 59
Midland Mining Co.	3	60					9	12	21	87 50	339 80	44 00	14 00	1,651 64	3,770 38	5,422 37
Mount Vernon Mining Co		120	1	1	1	1	25	3	28	10	100	42 00	30 00	1,420 04	2,000 00	3,420 00
Rinker Lead & Zinc Co	15	50	3	3	1	1	35	30	65	153 10	1,746	44 65	13 35	7,062 59	25,259 10	30,321 19
Seamon Mining Co	8	110	6	1	1		35	45	80	559 30	5,901 30	44 00	16 75	24,903 93	97,170 51	131,774 43
St. Louis & Aurora Mining Co	5	60	1	1			10	14	24	65 30	75 40	42 00	13 00	2,742 60	9,904 20	3,646 80
Totals	87		33	19	11	16	280	248	528	2,194 60	16,178 60	42 69	17 84	93,670 45	288,863 84	382,534 29

MADISON COUNTY.

Rowland, Hazard	3	125	7	4	1	12	164	119	283	6	4,165 90			199,324 89		199,324 89
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NEWTON COUNTY.

Granby Mining and Smelting Co.	48	90	30	33	8	17	185	74	259	46	1,111.40	5,298.30	40 00	12 00	44,457.28	63,319.60	107,676.88
K. D. F. Mining Co.	5	100	1	1	1	17	15	3	20	5	1.50	60.	43 00	11 50	64.50	690 00	754 50
Little Nugget Mining Co.	1	95	1	1	1	15	4	4	15	4	290.	290.	41 00	19 00	5,610 00	5,610 00	5,610 00
McClelland & Maunlin.	2	25	..	..	..	4	10	4	4	4	29.80	20.	40 00	13 00	1,459 00	240 00	1,459 00
Saginaw Lead and Zinc Co.	2	45	..	..	..	4	10	3	13	5	20.	404.70	40 00	19 00	800 00	7,889.88	1,040 00
Spring City Mining Co.	4	92	4	2	1	2	15	20	35	10	184.90	2,000.	37 00	19 00	7,310.12	30,000 00	14,900 11
Mosley Zinc Co.	1	90	1	1	3	5	8	5	13	..	100.	8,045.	44 00	15 00	4,400 00	107,849.59	84,400 00
Totals.....	63	..	37	38	13	24	294	105	359	70	1,457.10	8,045.	40 07	13 10	55,280.90	107,849.59	165,740.49

ST. FRANCOIS COUNTY.

Doe Run Lead Co.	3	110	9	9	4	35	132	101	233	20	3,500.	..	..	..	150,000 00	..	150,000 00
St. Joseph Lead Co.	3	890	12	6	10	110	267	64	331	31	16,848.80	..	..	..	587,012.88	..	587,012.88
Totals.....	6	..	21	15	14	145	399	165	564	41	20,348.80	..	..	..	737,012.88	..	737,012.88

WASHINGTON COUNTY.

Higginbotham, Z. F.	25	30	1	1	..	..	..	..	25	70.	..	..	40 00	..	2,800 00	..	2,800 00
McArthur, A. and P. ....	..	..	..	..	..	..	..	..	..	87.20	..	..	40 00	..	2,687.68	..	2,687.68
Palmer Lead Co.	40	70	2	2	..	..	50	..	50	800.	..	..	24 00	..	7,200 00	..	7,200 00
Shibboleth Lead Co. ....	..	..	..	..	..	..	..	..	..	50.	..	..	40 00	..	2,000 00	..	2,000 00
Stocking, C. A. ....	..	..	..	..	..	..	..	..	..	147.30	..	..	34 00	..	5,008.89	..	5,008.89
Union Mining and Smelting Co. ....	..	..	..	..	..	..	..	..	..	201.60	..	..	34 00	..	6,852.70	..	6,852.70
White, Thos. S. & Co. ....	..	..	..	..	..	..	..	..	..	40.50	..	..	31 00	..	1,255.50	..	1,255.50
Totals.....	65	..	3	3	..	..	50	..	50	38	876.60	..	31 74	..	27,804.77	..	27,804.77

TABLE IV—COMPARATIVE TABLE OF OUTPUT OF LEAD AND ZINC MINES, 1889 TO 1893 INCLUSIVE.

County.	Number of tons mined.					Zinc.					Total amount received for the output of lead and zinc ores for year ending June 30, 1893...
	Lead.					Zinc.					
	1889.	1890.	1891.	1892.	1893.	1889.	1890.	1891.	1892.	1893.	
Barry.....				84		180					
Christian.....		30	20								
Cole.....			45	35							
Dade.....	55		87.5	98.7		174	1,647.3	1,273.6	103.5	220	\$1,820.00
Franklin.....			231	180							
Greene.....	70.5	340.6	200.1	406.9		628	559.9	1,071.1	898.6		
Jasper.....	5,330.2	7,159.8	7,994	11,500.9	10,241	69,192	74,141.4	95,876	106,014.01	82,587.2	2,268,415.92
Jefferson.....	809	2,277	4,487	412.6	1,023.7	2,065	2,614	2,116	2,075	1,693	48,454.48
Lawrence.....	1,281.3	2,873.4	4,461.6	5,720.9	2,194.5	13,027.5	12,877.1	15,362.6	13,861.3	16,178.8	382,594.29
Madison.....	3,715	3,092.6	3,431.8	4,403.2	4,155.9						199,824.89
Madison.....		4.5	8			15.5		40			
Morgan.....											
Miller.....				25.1							
Moniteau.....		12	14.5								
Newton.....	1,863.3	1,757.5	1,504.6	1,249.6	1,467.1	6,990.2	8,295.4	7,900.7	8,343.7	8,045	165,740.49
Perry.....			15	6.5							
St. Francois.....	12,464.7	16,900	16,837.5	23,740	20,348.8						787,012.89
Washington.....	2,820.3	12,973.8	1,850.2	1,793.6	876.6	125					27,904.77
Totals.....	34,909.5	33,360.6	36,394	49,627	40,297.6	83,357.2	100,248.1	123,762	131,457.7	106,591	3,880,597.73

TABLE V—SHOWING ACCIDENTS IN LEAD AND ZINC MINES IN MISSOURI, BY COUNTIES.
JASPER COUNTY.

Name of employer.	Name of employe.	Occupation.	Age.	Married.	No. of children.	Non-fatal.	Fatal.	Was the injured party insured?	Am't of insurance.	Nature of accident.	Coroner's verdict.
				Single				Yes			
								No.			
Gregory Mining Co.	Henry Ray	Miner	27	1	1	1	1	"	\$300	Fall of boulder.	Unavoidable accident.
"	Chas. Page	"	23	1	1	1	1	"	300	"	"
Indiana & Missouri M. Co.	Benton Zellers	"	22	1	1	1	1	"	"	Fell down shaft.	"
Keller Mining Co.	Robt. Calvin	"	51	1	2	1	1	"	"	Struck by stone from blast.	No inquest.
Empire Zinc Co.	Geo. Spencer	"	30	1	3	1	1	"	"	Accidental blast; cut in face.	No inquest.
Frank Turk.	Thos. Benton.	"	30	1	1	1	1	"	"	Fell from tub down shaft.	"
South, Opun M. & Z. M. Co.	H. E. Coy.	"	31	1	1	1	1	"	"	Falling of roof.	"
"	H. E. Pyle	"	24	2	1	1	1	"	"	"	"
"	Geo. Krokakis	"	23	2	1	1	1	"	"	"	"
"	W. D. Haues.	"	43	1	4	1	1	"	"	"	"
"	W. E. Mitchell	"	27	1	1	1	1	"	"	"	"
Patterson & Cronch	Levi Patterson	"	24	1	1	1	1	"	"	Thawing giant powder	"
Shoenberger & Zogg	N. Bush	"	23	1	1	1	1	"	"	"	"
Franklin Zinc Co.	Jas. B. Johnston.	Supt.	46	1	1	1	1	"	"	Fell in shaft.	"
W. A. Rumbauid	Ed. Winters	Laborer	"	"	"	"	"	"	"	Fell from tub.	"
Kerr & Rhomase	N. Bruce	Miner	"	"	"	"	"	"	"	Exhausture blast.	"
Empire Zinc Co.	Ed. Morrison	"	"	"	"	"	"	"	"	Fell from tub; ruptured.	"
Tracy land.	W. Brown	"	"	"	"	"	"	"	"	Falling roof.	"
Newell & VanPool	Geo. O. Quinn	"	"	"	"	"	"	"	"	Fell from tub.	"
Center Creek land	D. E. Good	"	35	1	1	1	1	"	"	Fell 40 feet	"
Burch Mine.	Geo. Kline	"	40	1	1	1	1	"	"	Fell in shaft	"
Jas. Wilson.	"	"	"	"	"	"	"	"	"	"	"
Totals.			8	7	12	7	15	12	3		

LAWRENCE COUNTY.

Kentucky Mining Co.	Thos. Keith.	Miner	22	1	1	1	1	"		Falling of roof.	
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ACCIDENTS IN LEAD AND ZINC MINES—Continued.

NEWTON COUNTY.

Name of employer.	Name of employee.	Occupation.	Am't of insurance.	Nature of accident.	Coroner's verdict.
Roaring Springs M. Co.	Lef. Jamison	Foreman .....	.....	Falling rock .....	.....
			Was the injured party insured. Yes <input type="checkbox"/> No <input type="checkbox"/>		
			Fatal		
			Non-fatal		
			No. of children		
			Married		
			Single		
			Age		

TABLE VI.—SHOWING TONNAGE AND VALUE OF OUTPUT OF IRON MINES, YEAR ENDING JUNE 30, 1893.

Operator.	County.	Postoffice address.	No. of mines producing ore	Machinery in use.		Employees.			Total No. of tons mined	Average price per ton	Total value of the year's output....
				Boilers. . .	Pumps. . .	Miners. . .	Other employees ..	Total employees ..			
D. Carson Iron Co.	Howell.	West Plains	1	.....	2	13	.....	12	1,800	\$2 00	\$3,600 00
Missouri Iron Co.	Dent.	Salem.	1	.....	2	14	8	23	3,666	1 75	6,415 50
Silgo Furnace Co.	Dent.	Silgo.	2	.....	4	26	10	36	8,446	1 50	12,669 00
Meramec Iron Mining Co.	Crawford.	Midland.	1	.....	1	30	5	35	7,553	2 21	16,693 13
Iron Mountain Co.	St. Francois.	Iron Mountain	5	.....	6	149	59	208	65,518	2 50	163,795 00
Totals .....	.....	.....	10	.....	12	280	82	312	86,983	1 99	203,171 63

LIST OF PROPRIETORS AND OPERATORS.

DADE COUNTY.

Name of person or company.	Postoffice address.	Location of mine.
Alder & Hughes.....	Greenfield.	Greenfield.....

JASPER COUNTY.

Albatross Mining Co.....	Alba.....	Alba.....
Allgood Mining Co.....	Joplin.....	Belleville.....
Barbee Mining Co.....	".....	Joplin.....
Blende Mining Co.....	".....	".....
Chatham Mining Co.....	Webb City.....	Webb City.....
Cave Spring Mining Co.....	Carthage.....	Carthage.....
Center Creek Mining Co.....	Webb City.....	Webb City.....
Cherokee Mining Co.....	".....	".....
Daugherty & Davey.....	Cartersville.....	Cartersville.....
Daugherty, Davey & Daugherty.....	".....	".....
Davey, Tower & Co.....	".....	".....
Diamond Lead & Zinc Co.....	Blendeville.....	Blendeville.....
Empire Zinc Co.....	Joplin.....	Joplin.....
Eleventh Hour Mining Co.....	Webb City.....	Webb City.....
Garrison Mining Co.....	".....	".....
Get There Mining Co.....	".....	Cartersville.....
Gannon, James.....	".....	Webb City.....
Granby Mining & Smelting Co.....	Joplin.....	Joplin.....
Granby Mining & Smelting Co.....	Oronogo.....	Oronogo.....
Guengerich & Gregg.....	Joplin.....	Joplin.....
Gretchen Mining Co.....	".....	".....
Herold, F.....	Webb City.....	Cartersville.....
Harden & Cass.....	Cartersville.....	Webb City.....
Inter-City Mining Co.....	Joplin.....	Joplin.....
Jasper & LaReine Mining Co.....	".....	".....
Jasper Lead & Zinc Co.....	Webb City.....	Webb City.....
Joplin Syndicate.....	Joplin.....	Belleville.....
Leckie, W. M.....	".....	Joplin.....
Lewis, J. F.....	Webb City.....	Webb City.....
Margerum Mining Co.....	".....	".....
Mahaska Mining Co.....	Joplin.....	Blendeville.....
Motley Mining Co.....	Cartersville.....	Cartersville.....
Minneapolis & Webb City.....	Webb City.....	Webb City.....
Mound City Mining Co.....	".....	Cartersville.....
Moonshine Mining Co.....	Joplin.....	Joplin.....
Myers & Jemmison.....	Carthage.....	Carthage.....
McConey, D. C.....	Joplin.....	Joplin.....
Pacific Mining Co.....	Carthage.....	Carthage.....
Pearl Mining Co.....	Joplin.....	Joplin.....
Richland Mining Co.....	Webb City.....	Cartersville.....
Roaring Springs Mining Co.....	Joplin.....	Joplin.....
Rising Sun Mining Co.....	".....	Cartersville.....
Rex Mining & Smelting Co.....	".....	Joplin.....
Snyder Bros.....	".....	".....
Tower, Davey & Co.....	Cartersville.....	Cartersville.....
Troupe Mining Co.....	Webb City.....	".....
Turkey Creek Mining Co.....	Joplin.....	Joplin.....
Victor Mining Co.....	".....	".....
Western Zinc Co.....	".....	".....
West Hollow Lead & Zinc Co.....	Zincite.....	Zincite.....

PROPRIETORS AND OPERATORS—Continued.

JEFFERSON COUNTY.

Name of person or company.	Postoffice address.	Location of mine.
Valle Mining Co.....	Valle Mine.....	Valle Mine.....

LAWRENCE COUNTY.

Baldwin & Baldwin	Aurora	Aurora
Berry Mining Land	"	"
Brinkerhoff Zinc Co.....	"	"
Cleveland & Aurora Mining Land Co.....	"	"
Decatur Lead & Zinc Co.....	"	"
Elliot, S. G.....	"	"
Kentucky Mining Co.....	"	"
Louisville Lead & Zinc Co.....	"	"
Midland Mining Co.....	"	"
Mount Vernon Mining Co.....	Mount Vernon.....	Mount Vernon.....
Rinker Lead & Zinc Co.....	Aurora	Aurora
Schmook Mining Co.....	"	"
Seamon Mining Co.....	"	"
St. Louis & Aurora Mining Co.....	"	"

MADISON COUNTY.

Rowland, Hazard.....	Mine LaMotte	Mine LaMotte
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NEWTON COUNTY.

Granby Mining & Smelting Co.....	Granby	Granby
K. D. F. Mining Co.....	Newtonia	Newtonia
Little Nugget Mining Co.....	Wentworth.....	Wentworth.....
McClelland & Maupin	Joplin	Newton county
Saginaw Lead & Zinc Co.....	Saginaw	Saginaw
Spring City Mining Co.....	Joplin	Spring City.....
Mosley Zinc Co.....	Neosho	Neosho

ST. FRANCOIS COUNTY.

Doe Run Lead Co.....	Doe Run.....	Doe Run.....
St. Joseph Lead Co.....	Bonne Terre.....	Bonne Terre.....

PROPRIETORS AND OPERATORS—Continued.

WASHINGTON COUNTY.

Name of person or company.	Postoffice address.	Location of mine.
Higginbotham, Z. F.....	Fertile.....	Fertile
McArthur, A. P	Potosi	Potosi
Shibboleth Lead Co.....	Cadet.....	Cadet.....
Stocking, C. A.....	Richwood.....	Richwood
Union Mining & Smelting Co.....	Old Mines.	Old Mines.....
White, Thos. S. & Co.....	"	"
Palmer Lead Co.....	Palmer	Palmer

GLOSSARY

OF MINING TERMS USED IN MISSOURI IN MINING AND SMELTING LEAD AND ZINC ORES.

- Air-furnace**—A reverberatory furnace used to smelt lead in.
- Air-pipe**—A pipe made of canvas, or a wooden box, used in conveying ventilation to the workmen.
- Air-way**—Any passage used for the passage of the air current.
- Belgian zinc furnace**—A furnace for the production of zinc in which the calcined ore is distilled in tubular retorts.
- Black damp**—Choke damp; carbonic acid gas (CO_2), often found in the bottom of shafts and old unventilated workings. It will not support combustion.
- Black-jack**—Zinc blende.
- Blow fan**—A small centrifugal fan used to force air through canvas pipes or wooden boxes to the workmen.
- Blown-out shot**—When a blast blows out the tamping without bringing down the ore, it is said to be a blown-out shot.
- Bottom**—The landing at the bottom of the shaft or slope; the floor; the bottom rock or stratum underlying the ore deposit.
- Breast**—The heading from which the ore is being mined.
- Bucking ore**—Hand process of crushing ores which do not occur free.
- Calamine**—Zinc silicate—carrying 52 per cent of zinc when pure.
- Calcline furnace**—A furnace used for roasting ore in order to drive off certain impurities.
- Cave, or cave-in**—After the ore has been excavated the overlying roof gives way and falls and is called a cave-in.
- Chats**—1 The gravel-like tailings derived from the concentration of ores. 2 A low-grade ore, often too poor to handle; the refuse from concentration works.
- Charge**—The amount of materials added to the furnace at one time.
- Chert**—A silicious rock—often the gangue of lead and zinc.
- Cribbing**—Timbering a shaft with crib-work; commonly extends from surface down to the bed rock.
- Concentrating plant**—A complete plant for cleaning and preparing the ore for market, consisting of crushers, rolls and jigs.
- Crop, or out-crop**—Indications of an ore deposit sometimes observed upon the surface.
- Crusher**—A machine used for crushing ores and rock.
- Cotton rock**—1. Decomposed chert. 2. A variety of earthy limestone.
- Derrick**—The structure erected to sink a drill-hole, and the frame-work above shafts are sometimes called by this name.
- Digging**—Mining operations, excavating the ore or earth.
- Dip**—The angle of inclination of a mineral bed or vein measured from a horizontal line.
- Drill**—Any tool used for boring or drilling holes in rock or mineral.
- Dry bone**—Carbonate of lead
- Dump**—A pile or heap of ore or waste, rock, etc. 2. The tippie by which the cars or ore buckets are dumped.
- Entry or drift**—A water-level heading driven from the surface or bottom of shaft, through which the product is conveyed.
- Face, or working face**—The place at which work is being done; the ore-bearing stratum.
- Flint**—Chert rock.
- Flintshire furnace**—A kind of reverberatory furnace used for smelting lead ores.
- Float ore**—A term applied by miners to ore found loose in the clay or soil.
- Flux**—Iron ore, limestone and sand which are added in various proportions to the charge in a furnace to make the gauge melt up and blow off easily.
- Galena**—Lead sulphide, an ore carrying 86 per cent of lead, when pure.
- Hard lead**—Lead containing certain impurities, mainly nickel, cobalt, antimony, etc.
- Hoister**—A machine used in hoisting the product. It may be operated by steam or horsepower.
- Jack**—Zinc blend.
- Jig**—A machine used for separating ores from worthless rock by means of their difference in specific gravity.
- Lagging**—Small round timbers, slabs or planks driven in behind the legs and over the collars to prevent pieces of the roof or sides from falling through.
- Legs**—Props on which collars in gangways rest.
- Mill cinder**—The slag from the puddling furnace of a rolling-mill, used as a flux in lead smelting.

Mill run—The test of a given quantity of ore by actual treatment in a mill.

Matte—A compound of iron and other metals with sulphur, formed during lead smelting, in the slag furnace.

Mine—Any excavation made for the extraction of minerals.

Miner—This term is used to denote the workmen who mine the ore.

Mineral—A local term for galena or lead ore.

Mundic—Iron pyrites; bisulphide of iron.

Open cut—Any surface excavation.

Opening—A fissure or cave is often encountered in mining in the southwestern part of the State, and is locally known by this name.

Output—The mineral product of the mine.

Pebble jack—Zinc blende in small crystals or pebble-like forms that is not attached to rock, but is found in clay openings in the rock.

Percussion table—A kind of jolting table used in separating very fine ores from slimes.

Pillar—A portion of ore left to support the roof.

Plat or map—A map of the surface and underground workings, or of either; to draw such a map from surveys.

Poling—The process of purifying lead by stirring it while melted with green poles, and skimming off the dross that rises to the surface.

Post or prop—Any upright timber; applied particularly to the timbers used for propping the roof.

Prospect hole—Any shaft or drill-hole put down for the purpose of prospecting the ground.

Rolls—Machinery for reducing disseminated ores, so the minerals can be separated from the waste.

Roof—The rock or stratum overlying the ore deposit or vein.

Seam—A fissure or joint, either empty or filled with foreign matter. 2. A stratified bed of mineral.

Screen—Any sieve, whether coarse or fine mesh or bars, or perforated sheet metal, used for separating minerals into different grades, according to size.

Sheave—A wheel with grooved circumference, over which a rope is turned, either for the transmission of power or for hoisting.

Scrapper—A local name given to parties who pick up the ore left on dumps.

Shot—A drill-hole charged and fired; injured by a shot.

Silicate—An ore containing about 50 per cent of zinc when pure.

Slime—Silt containing very fine ore, which passes off in the water from the jigs.

Slag—The gangue of the ore with the fluxes which are added in the furnace, and which combine to make a mass that is easily melted, which blows off, leaving the lead or other metal in a free state in the furnace.

Smittem—Fine gravel-like ore, occurring free in mud openings, or derived from the breaking of the ore in blasting.

Smithsonite—Zinc carbonate, carrying 56 per cent of zinc when pure.

Speiss—A compound of arsenic, iron and sulphur added to the charge sometimes to extract the nickel and cobalt in the ore.

Stuff—A common expression among lead and zinc miners when referring to minerals.

String-pump—A system of pumping whereby the motion of the engine is transmitted to the pumps by timbers or stringers bolted together.

Stopping—After a heading has been driven, the underlying ore is mined out by stopping.

Tailings—Waste rock, dirt, etc., left after the minerals have been extracted.

Trolley—A small four-wheeled truck used for carrying the ore bucket underground.

Tiff—Calcite, or carbonate of lime.

Tuyere—The tubes through which air is forced into a furnace.

Tub—Ore bucket used in hoisting.

Wash place—A place where the ores are washed and separated from the waste, usually applied to places where hand-jigs are used.

Zinc ores—The various ores of zinc may be divided into: 1st, the sulphide ores, or zinc blende—these are termed "black jack," "rosin jack," "steel jack," etc., from the color. The ore, when pure, carries 67 per cent zinc. 2. The oxidized ores, "calamine," or the silicates of zinc known as "silicate," and "smithsonite," the carbonate of zinc also generally called as silicate. These ores carry about 50 per cent of zinc.

MINING LAWS OF MISSOURI.

CHAPTER 115.

ARTICLE 1—Mines and mining.

II—Safety and inspection of mines.

ARTICLE I.

MINES AND MINING.

SECTION

- 7034. Rights of miners and owners of mineral lands—condition of permits.
- 7035. Forfeitures.
- 7036. Tender of payment.
- 7037. Notice to owner or lessee.
- 7038. Sale of ore.
- 7039. Injunction or restraining orders—notice of application to dissolve.
- 7040. Affidavit of course of drift and order to be made.
- 7041. Order to be read.
- 7042. Refusal to obey order a misdemeanor.
- 7043. Owner or lessee shall drain mine, etc.
- 7044. Scrapping for ore prohibited, etc.—penalty.
- 7045. Indemnity bond required to mine in certain cities, etc.—violation a misdemeanor—penalty.
- 7046. Notice of intention to mine, publication required.
- 7047. Petition to circuit court—court to fix and approve bond.

SECTION

- 7048. Testimony on application—bond, etc.—time granted.
- 7049. Bond required.
- 7050. Written permission of property owner—violation, misdemeanor—penalty, fines, etc.
- 7051. Costs attending notice.
- 7052. Diagram of mines, etc., to be filed in court.
- 7053. Application of article to mining companies.
- 7054. Screening coal before weighing prohibited.
- 7055. Weighman shall take an oath, etc.—penalty.
- 7056. Penalty for using false scales.
- 7057. Shall apply to loaders in certain mines.
- 7058. Checks redeemable in money or goods, etc.
- 7059. Employees to be paid monthly, etc.
- 7060. Refusal to redeem orders—penalty.

SEC. 7034. *Rights of miners and owners of mineral lands—condition of permits —*

When any person owning real estate in this state, or any person having a leasehold interest in such real estate for mining purposes by lease from the owner thereof, duly acknowledged and recorded in the county wherein the land lies, shall permit any person or persons, other than their servants, agents or employees, to enter and dig or mine thereon for lead ore or other minerals, with the consent of such owner or owners or lessee, he or they shall keep a printed statement of the terms, conditions and requirements upon which such lands may be mined or prospected, and the time during which the right to mine or prospect thereunder shall continue, posted or hung up in a conspicuous place, in plain, legible characters, in the principal office or place of business of such person or company in the county in which said lands are situated, or in a county contiguous thereto, and shall deliver to any person mining or prospecting, or about to mine or prospect on said lands, and requesting it, a printed copy of such statement. All persons digging or mining on said lands, after the posting up of such statement, shall be deemed to have agreed to and accepted the terms thereof, and shall, together with such owner or lessor

be bound thereby, and upon failure or refusal to comply with the terms, conditions and requirements of such statement, he or they shall forfeit all right thereunder, and the owner or lessee, as aforesaid, of such lands, may re-enter thereon and take possession of the same; nor shall the receipt of any ore or mineral by any such owner or lessee, after any such forfeiture has been incurred, be deemed or taken as a waiver of such forfeiture. (R. S. 1879, § 6441—a.)

SEC. 7035. Forfeiture.—Whenever any such owner or lessee of real estate shall permit any person or persons, other than their servants, agents or employes, to enter and dig for lead ore or other minerals on such real estate, with his consent, but without such owner or lessee complying with the provisions of section 7034, and such person or persons having so entered upon said lands by the permission or consent of such owner or lessee as aforesaid, and having in good faith dug or opened any shaft, mine, quarry, prospect or deposit of mineral, or extended or opened from any shaft or mine any room, drift, entry or other excavation, he or they shall have the exclusive right as against such owner or lessee giving such permit or consent, and against any person claiming by, through or under such owner or lessee, to continue to work, mine and dig such shaft, mine, prospect or deposit of mineral so dug or opened by him or them as aforesaid, in said real estate, with a right of way over such lands for the purpose of such mining, for the term of three years from the date of the giving of such consent or permit: *Provided, however,* that if such person or persons, in each case so mining as aforesaid, shall fail or neglect to work or cause to be worked such shaft, mine, quarry, prospect or deposit of mineral for ten days, not including Sundays, in any one calendar month, after commencing said work, he or they shall forfeit all rights to work, mine or hold the same as against such owner or lessee, unless such failure or neglect was caused; by unavoidable circumstances, or by the act of such owner or lessee or his agent, or unless such owner or lessee consent thereto: *Provided, further,* that such person or persons, so mining as aforesaid, shall pay to the owner or lessee of said lands giving such permit or consent the royalty for mining thereon, at least once every month, if demanded by such owner or lessee, by delivering the same to him at or near the mouth or opening of such mine, shaft or quarry, or at the nearest usual place of business of such owner or lessee, or at any other place that may be agreed upon by such miner and owner or lessee; which said royalty, unless otherwise agreed upon by them, shall be the same in kind and proportionate amount as is paid by others mining the same kind of ore or mineral on said lands to such owner or lessee, or the value of such royalty in cash; and if there be no other person mining on said lands on terms prescribed by such owner or lessee, than he or they shall pay to such owner or lessee the same rate and kind of royalty on lead ore or minerals taken out by him or them as is paid by miners on lands nearest thereto belonging to other persons, or the value of such royalty in cash. Such owner or lessee of any real estate shall have a lien on all minerals taken or dug therefrom for the royalty due thereon until the same is paid; and if any such person or persons so mining shall refuse or fail to pay such royalty to such owner or lessee, or his agent, when demanded as aforesaid, he or they shall thereby forfeit the right to work such mine, shaft, quarry, prospect or deposit of mineral, and the said owner or lessee may thereupon enter and take possession of the same. (R. S. 1879 § 6442.)

SEC. 7036. Tender of payment.—Any such person or persons who, by the permission or consent of the owner or lessee of any real estate, and having the right

(a) The statement in this section amounts to a license, revocable upon condition broken, and on forfeited proprietor may re-enter and take possession. 74 Mo. 173.

to mine thereon, and having entered and dug or mined thereon any lead ore or other mineral, shall have the right to the exclusive possession of such ore or mineral, except the royalty thereon, which shall be paid as hereinbefore provided, until be or they shall be paid or tendered by such owner or lessee of such real estate the then highest market price in cash paid by such owner or lessee for the same kind of ore or mineral dug or mined on said lands, and if no other such ores or minerals are at the time being dug or mined on said lands and sold to such owner or lessee, then the highest price paid for such ore or mineral dug on lands nearest thereto shall be paid or tendered by such owner or lessee; in such case, and upon such payment or tender, the absolute right to the possession of such lead ore or other minerals so dug out and mined under the provisions of the next preceding section, and for which such payment or tender shall have been made, shall vest in such owner or lessee. (R. S. 1879, § 6443)

SEC. 7037. *Notice to owner or lessee.*—If any person or persons having dug or mined lead ore or other mineral, and having the same in his or their possession, and having offered to deliver such mineral according to contract, or paid or tendered the royalty, if any, due thereon, or the value of such royalty in cash, to such owner or lessee of said real estate, or to his agent, shall serve or cause to be served a notice in writing upon such owner or lessee or his agent, by delivering to him a copy thereof, or by leaving a copy thereof at the usual place of abode of such owner, lessee or agent, with some member of the family over the age of fifteen years, stating in such notice the amount of lead ore or other mineral he or they have ready for delivery, and requiring such owner, lessee or agent to receive and pay for the same, the said owner or lessee shall, within five days after the service of such notice, receive and pay for such lead ore or other mineral which the said person or persons digging or mining the same may deliver to him, not exceeding the amount named in the notice; and in such case, if such owner or lessee fail or refuse within the time aforesaid to pay for such lead ore or mineral delivered or offered to be delivered to him as aforesaid at the said price, then in that event the said person or persons who dug and mined the same shall thereupon acquire an absolute title to such lead ore or mineral, and may thereupon dispose of the same to any person or in any manner he or they may choose. (R. S. 1879, § 6444.)

SEC. 7038. *Sale of ore.*—All lead ore or other mineral, dug or mined in or upon the lands of any person in this state, shall be deemed and held to be the absolute property of the owner or lessee of such lands, except in cases it is modified, changed or transferred by express contract; and any person who shall unlawfully sell or convert to his own use or remove or dispose of or in any manner make away with or conceal any such ore or mineral, so as to deprive the owner thereof of the same shall be deemed guilty of grand or petit larceny, according to the value of such ore or mineral. (R. S. 1879, § 6445.)

SEC. 7039. *Injunction or restraining orders—notice of application to dissolve.*—No injunction or restraining order shall be granted by any court or by any judge thereof to enjoin or restrain the working of any mine or mines, or in any manner to interfere with the same, except upon notice first being given to the person working or operating said mine or mines, and sought to be enjoined or restrained, which notice shall be served by delivering to such person a copy thereof, or by leaving a copy thereof at his usual place of abode with a member of the family over the age of fifteen years, at least five days before the day set for the hearing of the application for the injunction; and the court or judge granting such injunction or restraining order shall have the power, upon good cause being shown, to dissolve, vacate or modify any such injunction or restraining order at any time after the same shall

have been granted, whether in term time or vacation: *Provided*, that the party applying to such court or judge to dissolve, vacate or modify any such injunction or restraining order shall give due notice to the opposite party of such intended application. (R. S. 1879, § 6446.)

SEC. 7040. *Affidavit of course of drift and order to be made.*—When any owner, tenant or sub-tenant of a lot or lots or tract of land shall file with any justice of the peace within the county in which said lot or lots or tract of land may be situated his or her affidavit, or the affidavit of any other creditable person for them, stating that from knowledge, information or belief, the party or parties owning, controlling or working the adjoining lot or lots or tract of land, and upon which said party or parties are sinking shafts, mining, excavating and running drifts, and that said drifts in which said parties are digging, mining and excavating mineral ore or veins of coal extend beyond the lines and boundaries of said lot or lots or tract of land, owned, controlled or worked by them, and have entered in and upon the premises of the party or parties making said affidavit, or for whom said affidavit is made, the justice of the peace, after first being tendered his lawful fees, shall issue his written order and deliver or cause the same to be delivered to the county surveyor or his deputy, commanding him, after his reasonable fees have been tendered, to proceed without delay to survey said drift, by entering any and all shafts upon said lot or lots or tract of land that he (the surveyor) may see fit, for the purpose of ascertaining the course and distance of said drift or drifts, and to locate the same upon the surface. (R. S. 1879, § 6447.)

SEC. 7041. *Order to be read.*—The surveyor shall, before entering upon said duty, read said order to the party or parties owning, controlling or working any shaft or shafts on said lot or lots or tract of land. (R. S. 1879, § 6448.)

SEC. 7042. *Refusal to obey order a misdemeanor.*—If said party or parties owning, controlling or working said shaft or shafts on said lot or lots or tract of land shall refuse, hinder or prevent said county surveyor or his deputy and his assistant from entering said shaft or shafts or drifts, to make the survey so ordered by the justice of the peace, and every person so offending shall, on conviction, be adjudged guilty of a misdemeanor, and punished by imprisonment in the county jail for a term of not exceeding one year, or by fine not exceeding three hundred dollars, or by both said fine and imprisonment. (R. S. 1879, § 6449.)

SEC. 7043. *Owner or lessee shall drain mine, etc.*—When any person owning any real estate in this state, or any person or persons having a leasehold therein for the purpose of mining for lead or zinc ore thereon by lease from such owner, shall open such real estate for mining purposes, and shall permit any person or persons other than their agents, servants or employes to enter and dig or mine for lead or zinc ores thereon, and shall make any rule or contract whereby any pump-rent or royalty is reserved unto said land owner or lessee for the drainage of the land so mined, and shall fail or refuse to drain any such land or mining lot to the full depth to which the laborers are working or seeking to work, but prevented by water, then and in such event, such owner or lessee thereof shall not be entitled to collect or retain any pump-rent or royalty so reserved as aforesaid for any ores taken from said mine or lot, below the depth of the water-level in said mine or lot, so long as said owner or lessee shall fail or refuse to drain said mine, nor shall such land owner or lessee be entitled to forfeit any right to hold and mine said lot so long as work is prevented therein by reason of water accumulated therein, on account of any failure to drain said mine by such land owner or lessee, any rule, contract or agreement to the contrary notwithstanding. (New section.)

SEC. 7044. *Scrapping for ore prohibited, etc.—penalty.*—It shall be unlawful for any person to take or in any manner receive or obtain any lead or zinc ore by means of gleaning or culling, commonly called “scrapping,” without first having obtained the written consent of the person having possession and control of the mine from which said ores are to be taken; and it shall be unlawful for any person or company of persons to purchase, or in any manner to receive any lead or zinc ore which may have been stolen or taken by means of culling or gleaning, commonly called “scrapping,” without such written consent as aforesaid, knowing that said ores have been so stolen or taken without written consent, as herein provided. Any person violating the provisions of this section, on conviction shall be punished by a fine of not more than one hundred dollars, or by imprisonment in the county jail not more than one year, or by both such fine and imprisonment; and the inadequacy of the price paid for such ore, the quantity purchased or received, and the fact that the person from whom such ores may have been purchased or received is not regularly engaged in running or operating mines for such ores, may be shown, and shall be received as *prima facie* evidence of guilty knowledge of the person so purchasing or receiving such ores: *Provided, however*, that nothing herein contained shall be so construed as to prevent any person from gleaning, culling or scrapping for ores about his own mine, nor to prevent any person from purchasing such ores when the same have been obtained in such manner by the owner or operator of any such mine. (New section.)

SEC. 7045. *Indemnity bond required to mine in certain cities, etc.—violation a misdemeanor—penalty.*—No person, company or corporation shall hereafter sink a shaft, mine, tunnel, excavate or drift for coal, or take out any coal of any kind within the corporate limits or designated boundaries of any city, town or village in this state containing one thousand inhabitants or more, without having first applied and filed, and have approved, an indemnity bond as hereinafter provided for; and any person or persons violating the provisions of this section, and any member or stockholder or officer of any company or corporation who shall violate the provisions of this section, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by a fine of not less than five hundred dollars, or imprisonment in the county jail for not less than six months, or by both such fine and imprisonment. (R. S. 1879, § 6450.)

SEC. 7046. *Notice of intention to mine—publication required.*—Every person, company or corporation desiring to carry on any of the mining operations provided for in the preceding section shall give at least thirty days' notice of such intention by notice printed and published in some newspaper printed in such town, city or village where such mining operations are proposed to be carried on, or if no newspaper be printed in such city, town or village, then in some newspaper printed in said county, or if no newspaper be printed in such county, then by written or printed hand-bills posted up in six public places in the city town or village wherein such mining operations are proposed to be carried on. Such notice shall contain an accurate description of the locality where such mining operations are to be carried on, giving the number of lot and block, and shall also state the nature of such mining operations, and name some day of the term of the next circuit court in said county, thereafter to be holden, when such person, company or corporation will offer for filing and approval the indemnity bond hereinafter provided for. (R. S. 1879, § 6451.)

SEC. 7047. *Petition to circuit court—court to fix and approve bond.*—On the day mentioned in such notice, the persons, company or corporation proposing to carry on such mining operations shall present their petition to said circuit court, setting

the locality of the proposed mines and the nature and extent of the proposed mining operations, and shall also file with such petition the title papers of such person or company or corporation to the lands on which such mining operations are proposed to be carried on, showing either the fee simple title of such land in such company, or the right to mine beneath or in such land, and shall also contain the names of all persons to be offered as security upon the mining bond of such persons, company or corporation, and shall pray the court to fix and approve the mining bond of such persons or corporation. (R. S. 1879, § 6452.)

SEC. 7048. *Testimony on application—bond, etc.—time granted.*—The court may, upon such application, hear testimony upon all the matters involved in such application, including testimony upon the solvency and responsibility of the sureties offered, and may hear testimony from any parties interested in the lots and lands in the neighborhood of such proposed mining operations, and if the court is satisfied that the proposers own the land or mining privileges under the land described in their petition, the court shall fix the amount of the bond to be given by such proposers, such bond to be in no case for less than one thousand dollars; and upon the giving and approval of such bond so fixed by the court, the court shall enter its order authorizing the mining operations specified in said petition, and upon the localities therein named, and not elsewhere, for the space of two years, unless in the meanwhile revoked. (R. S. 1879, § 6453.)

SEC. 7049. *Bond required.*—Such bond shall be signed by the proposers, and by not less than two sureties, to be approved by said court, residents of the county wherein such mining is to be carried on, and shall be made payable to the state of Missouri, and conditioned that the principal in said bond shall carry on the mining operations proposed in the petition in a careful manner, and the said parties shall not mine, dig, excavate nor take coal nor earth from nor under any land or lots than that described in the said bond, and shall pay all damages that may be sustained by any and all persons by reason of the violation of any of the conditions of said bond, and any and all charges, fines and penalties that may be levied, assessed against or imposed upon the said proposers, their agents, servants, stockholders, officers or employes, by reason of any violation of the conditions of said bond, or any of the provisions of this law. (R. S. 1879, § 6454.)

SEC. 7050. *Written permission of property owner—violation, misdemeanor—penalty, fines, etc.*—Any person or persons who shall, in person or by their servant, agent or employe, dig, excavate, mine, tunnel or drift upon or under the lands or lots of another, within the incorporate limits or designated boundaries of any city, town or village in this state, and every officer and stockholder that shall either authorize or permit its servants, agents or employes to dig, excavate, mine, tunnel or drift upon or under the lands or lots of another within such limits or boundaries of such city, town or village, without the written permission of the owner or owners of such land or lots, shall be deemed guilty of a misdemeanor, and shall be punished, on conviction, for every such offense, by fine of not less than five hundred dollars, with costs, which fine and costs, if not paid within five days after conviction, may be sued for and recovered against the parties and sureties on the mining bond of such persons, company or corporation liable for such acts, in a suit upon such bond, in the name of the state of Missouri, to the use of the county in which such offense is committed; such fine, when collected, shall be paid, one-half to the owner of the property injured by such offense, and the other half into the school fund of such county; but no such conviction shall be a bar to the owner of such property prosecuting a suit on said bond to his own use for the damages sustained by any such offense. Every such conviction, whether appealed from or not, shall work a for-

feiture of the authority to mine granted such person, company or corporation liable, and they shall not proceed further with the operations, except by making application and giving a new bond as in the first instance. (R. S. 1879, § 6455.)

SEC. 7051. *Costs attending notice.*—The costs attending the giving notice, making application and receiving mining privileges shall all be paid by the person, company or corporation making the same, and no such privilege shall take effect until all such costs be paid. (R. S. 1879, § 6456.)

SEC. 7052. *Diagram of mines etc., to be filed in court.*—At each term of the circuit court, during the continuance of any mining license, every person, company or corporation carrying on such mining operations shall, at their own expense, cause to be made by the county surveyor of the county where such mines are located, and filed with the court, under oath of such surveyor, a complete and true diagram of such mines, showing with reference to the boundaries of such mines, and the lots and lands of neighboring owners, the extent of such mines, their drifts, tunnels and excavations, giving the length and breadth of each drift, bank and tunnel, so as to fully inform the court and parties in interest of the extent and character of such mining operations. Such plats and diagrams shall remain on file with the clerk of such court, and shall not be removed by any one from the files of such court. Any failure to file the diagram and plat herein provided for, or to make such diagram show all the particulars herein provided for, shall work a forfeiture of the mining privileges of such person, company or corporation, which forfeiture the court shall on the motion of any party in interest, declare on three days' notice to the party holding such license or privilege. (R. S. 1879, § 6457.)

SEC. 7053. *Application of article to mining companies.*—In no case shall the eight preceding sections of this article be so construed as to apply to persons, companies or corporations engaged in mining for lead, zinc or other ores of minerals, except coal. (R. S. 1879, § 6458, amended.)

SEC. 7054. *Screening coal before weighing prohibited.*—It shall be unlawful for any mine owner, lessee or operator of coal mines in this state, employing miners at bushel or ton rates, or other quantity, to pass the output of coal mined by said miners over any screen or other device which shall take any part from the value thereof, before the same shall have been weighed and duly credited to the employe sending the same to the surface, and accounted for at the legal rate of weights as fixed by the laws of Missouri. (Laws 1885, p. 207.)

SEC. 7055. *Weighman shall take an oath, etc., penalty.*—The weighman employed at any mine shall subscribe an oath or affirmation before a justice of the peace, or other officer authorized to administer oaths, to do justice between employer and employe, and weigh the output of coal from the mines as herein provided. The miners employed by or engaged in working for any mine owner, operator or lessee of any mine in this state shall have the privilege, if they desire, of employing at their own expense a check-weighman, who shall have like rights, powers and privileges in the weighing of coal as the regular weighman, and be subject to the same oath and penalties as the regular weighman. Said oath or affirmation shall be kept conspicuously posted in the weigh office, and any weigher of coal, or person so employed, who shall knowingly violate any of the provisions of this article, shall be deemed guilty of a misdemeanor, and, upon conviction, shall be punished by fine of not less than twenty-five nor more than one hundred dollars for each offense or by imprisonment in the county jail for a period not to exceed thirty days, or by both such fine and imprisonment—proceedings to be instituted in any court having competent jurisdiction. (Laws 1885, p. 208, amended, Laws 1887, p. 1 amended.)

SEC. 7056. *Penalty for using false scales.*—Any person or persons having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever, by reason of which such coal is not correctly weighed and reported in accordance with the provisions of this article, shall be deemed guilty of a misdemeanor, and shall, upon conviction, for each such offense, be punished by a fine of not less than two hundred dollars nor more than five hundred dollars, or by imprisonment in the county jail for a period not to exceed sixty days, or by both such fine and imprisonment, proceedings to be instituted in any court of competent jurisdiction. (Laws 1885, p. 208.)

SEC. 7057. *Shall apply to loaders in certain mines.*—The manner of weighing, as hereinbefore provided for, shall apply to the class of workers in mines known as loaders, engaged in mines wherein the mining is done by machinery, whenever the workmen are under contract to load coal by the bushel, ton, or any quantity the settlement of which is had by weight. (Laws of 1885, p. 208, amended.)

SEC. 7058. *Checks redeemable in money or goods, etc.*—It shall not be lawful for any corporation, person or firm engaged in manufacturing or mining in this state to issue, pay out or circulate for payment of the wages of labor, any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the United States, unless the same is negotiable and redeemable at its face value, without discount, in cash or in goods, wares or merchandise or supplies, at the option of the holder, at the store or other place of business of such firm, person or corporation, or at the store of any other person on whom such paper may be drawn, where goods, wares or merchandise are kept for sale, sold or exchanged; and the person who, or corporation, firm or company which, may issue any such order, check, memorandum, token or other evidence of indebtedness, shall, upon presentation and demand, within thirty days from date or delivery thereof, redeem the same in goods, wares, merchandise or supplies at the current cash market price for like goods, wares, merchandise or supplies, or in lawful money of the United States, as may be demanded by the holder of any such order, memorandum, token or other evidence of indebtedness: *Provided*, that if said corporation, person or firm engaged as specified in this section have a regular pay-day once in every thirty days, then said corporation, person or firm shall not be required to redeem such token or evidence of indebtedness in cash until the first pay-day after the same become payable, as herein provided, and such token or evidence of indebtedness shall be presented for payment in cash only on such pay-days. (Laws 1881, p. 73, amended, Laws 1885, p. 83.)

SEC. 7059. *Employees to be paid monthly, etc.*—The employees of operators of mines mentioned in this article shall be regularly paid at least once in every thirty days, and at no pay-day shall there be withheld of the earnings of any employe any sum to exceed the amount due him for his labor for the four days next preceding any such pay-day. And such operators shall, whenever demand therefor shall be made by any employe, issue to such employe a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on any pay-day, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employes, or to issue to them his due-bills as in this section provided, shall become immediately liable to any such employe in double the sum due such employe at the time of such failure or refusal, to be recovered by civil action in the name of each employe in any court of competent jurisdiction of the state. And no employe

within the meaning of this article shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof. (New section.)

SEC. 7060. *Refusal to redeem orders—penalty.*—Any officer or agent of any corporation, or any person, firm or company engaged in the business of manufacturing or mining in this state, who by themselves or agent shall issue or circulate in payment for wages of labor any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the United States, without being negotiable and payable at the option of the holder in goods, wares, merchandise, supplies or lawful money of the United States, as required by section 7058 of this article, or who shall fail to redeem the same when presented for payment within thirty days from date of delivery thereof, by said company or its agent at his or their office or place of business, in lawful money of the United States, or who shall compel or attempt to coerce any employe of any such corporation, person, firm or company to purchase goods, wares, merchandise or supplies from any particular person, firm or corporation, shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than five hundred dollars for each and every such offense. (Laws 1885, p. 84.)

ARTICLE II.

SAFETY AND INSPECTION OF MINES.

SECTION

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- 7062. Inspector to make maps if owner fails, etc.
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SECTION

- 7069. Accidents—duty and power of inspector, etc.
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- 7077. Explosives to be kept in strong box, etc.

SEC. 7061. *Maps of mines to be prepared, etc.*—The owner, agent or operator of each and every mine in this state, employing ten or more men, shall make or cause to be made, at the discretion of the inspector or other person acting in that capacity, an accurate map or plan of the workings of such mine and each and every vein thereof, showing the general inclination of the strata, together with any material deflections in the said workings and the boundary lines of said mine, and deposit a true copy of said map or plan with the clerk of the county court of each county wherein may be located the said mine; which said map or plan shall be so filed or deposited within three months after the time when this article shall take effect, and a copy of such map or plan shall also be kept for inspection at the office of the said mine; and during the month of January of each and every year after this article shall have taken effect, the said owner, agent or operator shall furnish the inspector and the clerk of the county court as aforesaid with a statement, and a further map or plan of the progress of the workings of such mine, continued from the last report to the end of the month of December next preceding, and the inspector shall correct his map or plan of said workings in accordance with the statement and map or plan

thus furnished; and when any mine is worked out or abandoned, that fact shall be reported to the inspector, and the map or plan of such mine in the office of the clerk of the county court shall be carefully corrected and verified. (Laws 1887, p. 219.)

SEC. 7062. *Inspector to make map if owner fails—cost.*—Whenever the owner, agent or operator of any mine shall neglect, fail or refuse to furnish the said inspector and clerk as aforesaid with a statement, the map or plan or addition thereto, as provided in the first section of this article, at the times and in the manner therein provided, the said inspector is hereby authorized to cause an accurate map or plan the workings of such mine to be made at the expense of the said owner, agent for operator, and the cost thereof may be recovered by law from said owner, agent or operator, in the same manner as other debts, by suit in the name of the inspector and for his use. (Laws 1887, p. 219.)

SEC. 7063. *Escapement shafts, when and how constructed, etc.*—In all coal mines that are now or have been in operation prior to the first day of January, 1887, and which are worked by or through a shaft, slope or drift, and in which more than ten miners are employed in each twenty-four hours, if there is not already an escapement shaft to each and every said mine, or communication between each and every mine and some other contiguous mine, then there shall be an escapement shaft or other communication, such as shall be approved by the mine inspector, making at least two distinct means of ingress and egress for all persons employed or permitted to work in such mine. Such escapement shaft or other communication with a contiguous mine aforesaid shall be constructed in connection with every vein or stratum of coal worked in such mine, and the time to be allowed for such construction shall be one year when such mine is under one hundred feet in depth, two years when such mine is over one hundred feet and under three hundred feet, and three years when it is over three hundred feet and under four hundred feet, and four years when it is over four hundred feet in depth, and five years for all mines over five hundred feet, from the time this article goes into effect; and in all cases where the working face of one mine has been driven up to or into the workings of another mine, the respective owners of such mine, while operating the same, shall keep open a roadway at least two and one-half feet high and four feet wide, thereby forming a communication as contemplated in this article, and for a failure to do so shall be subject to the penalty provided for in section 7069 of this article, for each and every day such roadway is unnecessarily closed. Each and every such escapement shaft shall be separated from the main shaft by such extent of natural strata as shall secure safety to the men employed in such mines—such distance to be left to the discretion and judgment of the mine inspector or person acting in that capacity; and in all coal mines that shall go into operation for the first time after the first day of January, 1888, such an escapement or other communication with a contiguous mine, as aforesaid, shall be constructed within one year after such mine shall have been put into operation. And it shall not be lawful for the owner, agent or operator of any such mine as aforesaid, to employ any person to work therein, or permit any person to go therein for the purpose of working, except such persons as may be necessary to construct such an escapement shaft, unless the requirements of this section shall have first been complied with; and the term “owner” used in this article shall mean the immediate proprietor, lessee or occupant of any mine, or any part thereof, and the term “agent” shall mean any person having, on behalf of the owner, the care or management of any mine, or any part thereof: *Provided*, nothing in this section shall be construed to extend the time allowed by law for constructing escapement shaft. (Laws 1887, p. 219, amended.)

SEC. 7064. *Ventilation—fire-damp.*—The owner, agent or operator of every mine whether operated by shaft, slope or drift, shall provide and maintain for every such mine a sufficient amount of ventilation, to be determined by the inspector, at the rate of one hundred cubic feet of air per man per minute, measured at the foot of the down-cast, which shall be forced and circulated to the face of every working place throughout the mine, so that said mine shall be free from standing gas of whatsoever kind; and in all mines where fire-damp is generated, every working place where such fire-damp is known to exist shall be examined every morning with a safety-lamp by a competent person, before any other persons are allowed to enter. The ventilation required by this section may be produced by any suitable appliances, but in case a furnace shall be used for ventilating purposes, it shall be built in such a manner as to prevent the communication of fire to any part of the works, by lining the upcast with incombustible material for a sufficient distance up from said furnace. (Laws 1887, p. 220.)

SEC. 7065. *Bore-holes.*—The owner, agent or operator shall provide that bore-holes shall be kept twenty feet in advance of the face of each and every working place, and, if necessary, on both sides, when driving toward an abandoned mine and part of a mine suspected to contain inflammable gases or to be inundated with water. (Laws 1887, p. 220.)

SEC. 7066. *Signaling—hoisting—certain minors not to work, etc.*—The owner, agent or operator of every mine operated by shaft shall provide suitable means of signaling between the bottom and the top thereof, and shall also provide safe means of hoisting and lowering persons in a cage covered with boiler iron, so as to keep safe, as far as possible, persons descending into and ascending out of said shaft; and such cage shall be furnished with guides to conduct it on slides through such shaft, with a sufficient break on every drum to prevent accident in case of the giving out or breaking of machinery; and such cage shall be furnished with spring catches, intended and provided, as far as possible, to prevent the consequences of cable breaking or the loosening or disconnecting of the machinery; and no props or rails shall be lowered in a cage while men are descending into or ascending out of said mine: *Provided*, that the provisions of this section in relation to covering cages with boiler iron shall not apply to coal mines less than one hundred feet in depth, where the coal is raised by horse-power. No male person under the age of twelve years, or female of any age, shall be permitted to enter any mine to work therein; nor shall any boy under the age of fourteen years, unless he can read or write, be allowed to work in any mine. Any party or person neglecting or refusing to perform the duties required to be performed by the provisions of this article shall be deemed guilty of a misdemeanor, and punished by a fine in the discretion of the court trying the same, subject, however, to the limitations as provided by section 7069 of this article. (Laws 1887, p. 221, amended.)

SEC. 7067. *Regulations for hoisting*—No owner, agent or operator of any mine operated by shaft or slope shall place in charge of any engine whereby men are lowered into or hoisted out of the mines, any but an experienced, competent and sober person, not under eighteen years of age; and no person shall be permitted to ride upon a loaded cage or wagon used for hoisting purposes in any shaft or slope, and in no case shall more than twelve persons ride on any cage or car at one time, nor shall any coal be hoisted out of any mine while persons are descending into such mine; and the number of persons to ascend out of or descend into any mine on one cage shall be determined by the inspector; the maximum number so

fixed shall not be less than four nor more than twelve, nor shall be lowered or hoisted more rapidly than five hundred feet to the minute. (Laws 1887, p. 221, amended)

SEC. 7068. *Boilers—fencing entrances—signals, etc.*—All boilers used in generating steam in and about coal mines shall be kept in good order, and the owner, agent or operator, as aforesaid, shall have the said boiler examined and inspected by hydrostatic pressure and warm water, by a competent boiler-maker or other qualified person, as often as once every six months, and the result of every such examination shall be certified in writing to the mine inspector; and the top of each and every shaft, and the entrance of each and every immediate working vein, shall be securely fenced by gates properly covering and protecting such shaft and entrance thereto; and the entrance to every abandoned slope, air or other shaft, shall be securely fenced off; and every steam boiler shall be provided with a proper steam-gauge, water-gauge and safety-valve, and all under-ground self-acting or engine planes or gangways on which coal cars are drawn and persons travel, shall be provided with some proper means of signaling between the stepping places and the end of said planes or gangways, and sufficient places of refuge at the sides of such planes or gangways shall be provided at intervals of not more than twenty feet apart. (Laws 1887, p. 221, amended.)

SEC. 7069. *Accidents—duty and power of inspector, etc.*—Whenever loss of life or serious personal injury shall occur by reason of any explosion or of any accident whatsoever, in or about any mine, it shall be the duty of the person having charge of such mine to report the facts thereof without delay to the state mine inspector, and if any person is killed thereby, to notify the coroner of the county also, or in his absence or inability to act, any justice of the peace of said county; and the said inspector shall, if he deem it necessary from the facts reported, immediately go to the scene of said accident and make suggestions and render such assistance as he may deem necessary for the safety of the men; and the inspector shall investigate and ascertain the cause of such explosion or accident and make a report thereof, which he shall preserve with the other records of his office; and to enable him to make such investigation, he shall have the power to take depositions, compel the attendance of witnesses and administer oaths or affirmations to them; and the cost of such investigation shall be paid by the county court of the county in which such accident shall have occurred, in the same manner as costs of coroners' inquests are now paid. And a failure on the part of the person having charge of any mine in which any such accident may have occurred to give notice to the inspector or coroner, as provided for in this section, shall subject such person to a fine of not less than one hundred nor more than three hundred dollars, to be recovered of him in the name of the state of Missouri, before any justice of the peace of such county wherein the mine is situate and the accident occurred; and such fine, when collected, shall be paid into the county treasury for the use and benefit of said county. (Laws 1887, p. 222.)

SEC. 7070. *Fines, how recovered.*—In all cases in which punishment is not provided for by fine under this article, for a breach of any of its provisions, the fine for the first offense shall not be less than fifty nor more than two hundred dollars, and for the second offense not less than two hundred nor more than five hundred dollars, to be recovered in any court of the state having competent jurisdiction. (Laws 1887, p. 222.)

(Section 7071, Laws of 1887, repealed, and the following section enacted in lieu thereof:)

(Section 1.) That section 7071, article 2, chapter 115, Revised Statutes of 1889, be and the same is hereby amended, by striking out said section and enacting a new section in lieu thereof, to be known as section 7071, as follows :

SEC. 7071. The governor shall appoint two mine inspectors—one for coal mines, who shall have had practical experience in coal mining, and one for lead, zinc, iron and other mines, and shall have practical mining experience in mines other than coal mines ; neither of whom shall be interested in any mine ; each to receive a salary of \$1500 per annum and actual traveling expenses, to be paid quarterly out of the general revenue fund. They shall have their office in the office of the Commissioner of Labor Statistics, and when not inspecting mines, act as clerks in said office, giving their whole time to the state.

Approved April 18, 1893.

SEC. 7072. *Duties of inspector—reports.*—The inspector provided for in this article shall see that every necessary precaution is taken to insure the health and safety of the workmen employed in any of the mines in this state, that the provisions and requirements provided for in this article be faithfully observed and obeyed, and the penalties of the law enforced. He shall also collect and tabulate in his report, to be made to the bureau of labor statistics on the 15th day of October of each year, the extent of workable mining lands in this state, by counties ; also, the manner of mining, whether by shaft, slope or drift, the number of mines in operation, the number of men employed therein, the amount of capital invested, and the amount of mineral, coal, etc., produced. (Laws 1887, p. 222.)

SEC. 7073. *Inspector may enter mines at any time, etc.*—It shall be lawful for the inspector provided for in this article to enter, examine and inspect any and all mines and machinery belonging thereto, at all reasonable times, by day or by night, but so as not to obstruct or hinder the necessary workings of such mine, and the owner, agent or operator of every such mine is hereby required to furnish all necessary facilities for such entering, examination and inspection ; and if the said owner, agent or operator aforesaid shall refuse to permit such inspection, or to furnish the necessary facilities for such entry, examination and inspection, the inspector shall file his affidavit setting forth such refusal before the judge of the circuit court in said county in which said mine is situated, either during the term of the court or during vacation, and obtain an order on such owner, agent or operator so refusing as aforesaid, commanding him to permit and furnish such facilities for the inspection of such mine, or to be adjudged to stand in contempt of court and punished accordingly ; and if the said inspector shall, after examination of any mine and the works and machinery pertaining thereto, find the same to be worked contrary to the provisions of this article, or unsafe for the workmen therein employed, said inspector shall, through the circuit attorney of his county, or any attorney in case of his refusal to act, acting in the name and on behalf of the state, proceed against the owner, agent or operator of such mine, either separately or collectively, by injunction, without bond, after giving at least two days' notice to such owner, agent or operator ; and said owner, agent or operator shall have the right to appear before the judge to whom application is made, who shall hear the same on affidavits and such other testimony as may be offered in support as well as in opposition thereto ; and if sufficient cause appear, the court, or judge in vacation, by order, shall prohibit the further working of any such mine in which persons may be unsafely employed contrary to the provisions of this article, until the same shall have been made safe and the requirements of this article shall have been complied with ; and the court shall award such costs in the matter of said injunc-

tion as may be just; but any such proceedings so commenced shall be without prejudice to any other remedy permitted by law for enforcing the provisions of this article. (Laws 1887, p. 223.)

SEC. 7074. *In case of injury or death, right of action.*—For any injury to persons or property occasioned by any willful violation of this article, or willful failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby; and in case of loss of life by reason of such willful violation or willful failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives. (Laws 1887, p. 223.)

SEC. 7075. *Rules of working mines—penalty.*—Any miner, workmen or other person who shall knowingly injure any water-gauge, barometer, air-course or brattice, or shall obstruct or throw open any air-ways, or carry any lighted lamps or matches into places that are worked by the light of safety lamps, or shall handle or disturb any part of the machinery of the hoisting engine, or open a door to a mine and not have the same closed again, whereby danger is produced, either to the mine or those at work therein, or who shall enter into any part of the mine against caution, or who shall disobey any order given in pursuance of this article, or who shall do any willful act whereby the lives and health of persons working in the mine, or the security of the mine or miners or the machinery thereof is endangered, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by fine or imprisonment, at the discretion of the court. (Laws 1887, p. 224.)

SEC. 7076. *Prop timbers.*—The owner, agent or operator of any mine shall keep a sufficient supply of timber, when required to be used as props, so that the workmen may at all times be able to properly secure the said workings from caving in, and it shall be the duty of the owner, agent or operator to send down all such props when required. (Laws 1887, p. 224.)

SEC. 7077. *Explosives to be kept in strong box, etc.*—All miners or other persons employed in and about a mine, using gun and blasting powder or other explosive, shall have and keep a strong box in which all surplus gun or blasting powder or other explosive in the mine shall be kept, excepting so much only as is necessary for immediate use. These boxes shall be kept locked, and not opened unless it be to put in or take out powder; nor must these strong (or powder) boxes be nearer than one hundred feet to the place of blasting. And in all dry and dusty coal mines or mines discharging light carbonated hydrogen gas, shot-firers must be employed to fire all shots after the employes and other persons have retired from the mine: *Provided, however,* that the above section shall refer only to mines working ten or more men. (New section.)

WAGES OF LABOR.

AN ACT to amend section 7059, of the Revised Statutes for the State of Missouri for 1889, concerning mines and mining.

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. That section 7059, of chapter 115, article I, of the Revised Statutes of Missouri of 1889, be amended by striking out the word "thirty," between the words "every" and "days," in the third line of said section, and inserting in lieu thereof the word "fifteen;" so that said section, when amended, shall read as follows:

Section 7059. *Employees to be paid semi-monthly, etc.*—The employees of operators of mines mentioned in this article shall be regularly paid at least once in every fifteen days, and at no pay-day shall there be withheld [any] of the earnings of any employee. And such operators shall, whenever demand therefor shall be made by any employee, issue to such employee a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on demand, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employees, or to issue to them his due-bills, as in this section provided, shall become immediately liable to any such employee in double the sum due such employee at the time of such failure or refusal, to be recovered by civil action, in the name of such employee, in any court of competent jurisdiction of the state. And no employee, within the meaning of this article, shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof.

Approved April 20, 1891.

INSPECTION.

AN ACT to amend section 7074, chapter 115, article 2, of the Revised Statutes of the state of Missouri, relating to the safety and inspection of mines.

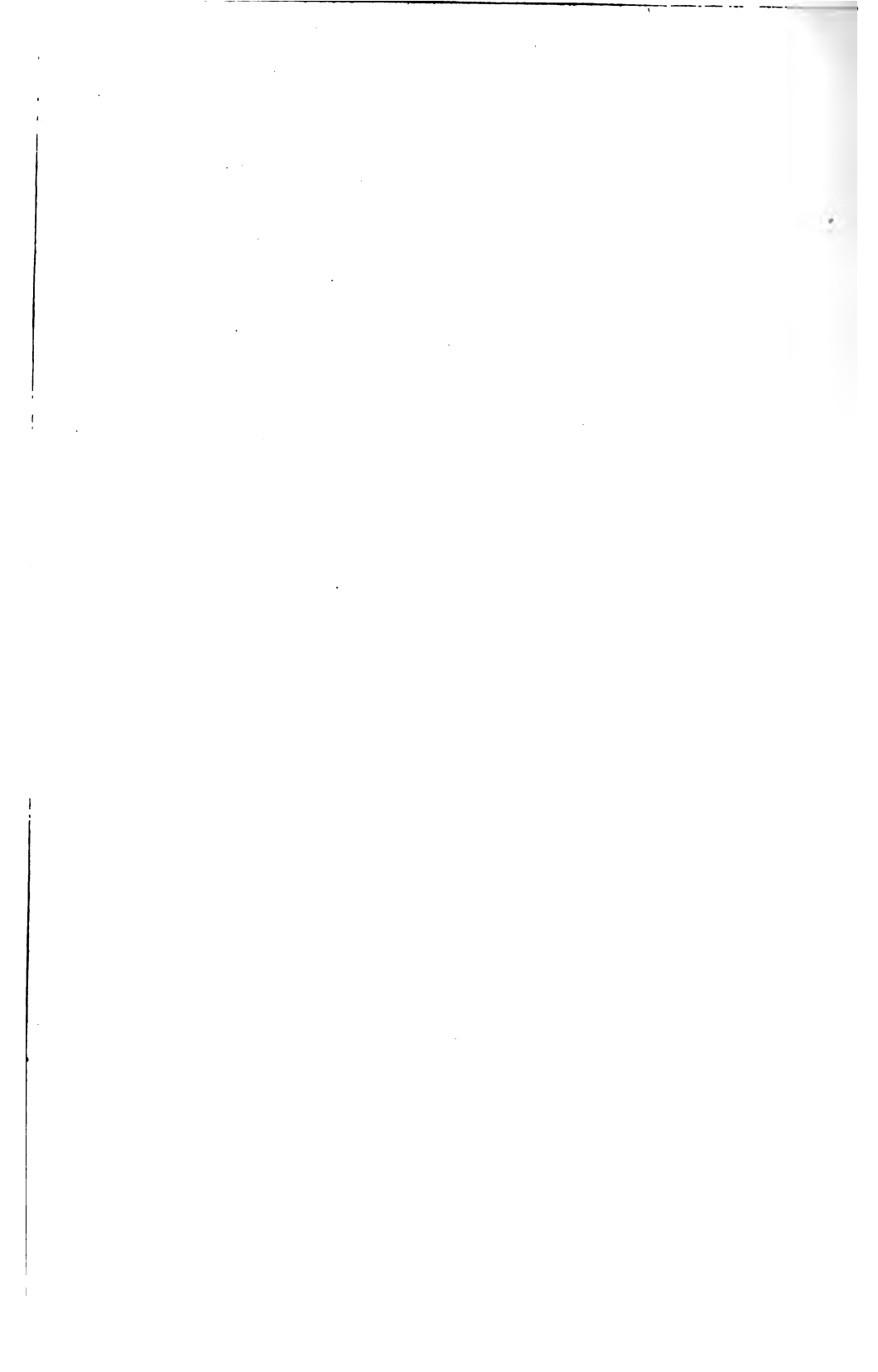
Be it enacted by the General Assembly of the State of Missouri, as follows :

SECTION 1. That section 7074, chapter 115, article 2, of the Revised Statutes of the state of Missouri, be and the same is hereby amended by striking out the word "willful" wherever the same occurs in said section—namely, after the word "any," in line two, after the word "or," in line three, and after the words "such" and "or" in line five—so that said section, when amended, shall read as follows :

Section 7074. For any injury to persons or property occasioned by any violation of this article or failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby ; and in case of loss of life by reason of such violation or failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives : *Provided*, that all suits brought under this article shall be commenced within one year after any cause of action shall have accrued under this article, and not afterward ; and *provided further*, that any person entitled to sue under this section for loss of life or lives may recover any sum not exceeding ten thousand dollars.

Approved April 23, 1891.

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